More Electronic Special Effects—page 31

STARLOG presents

CINEMAGIC

THE GUIDE TO FANTASTIC FILMMAKING™

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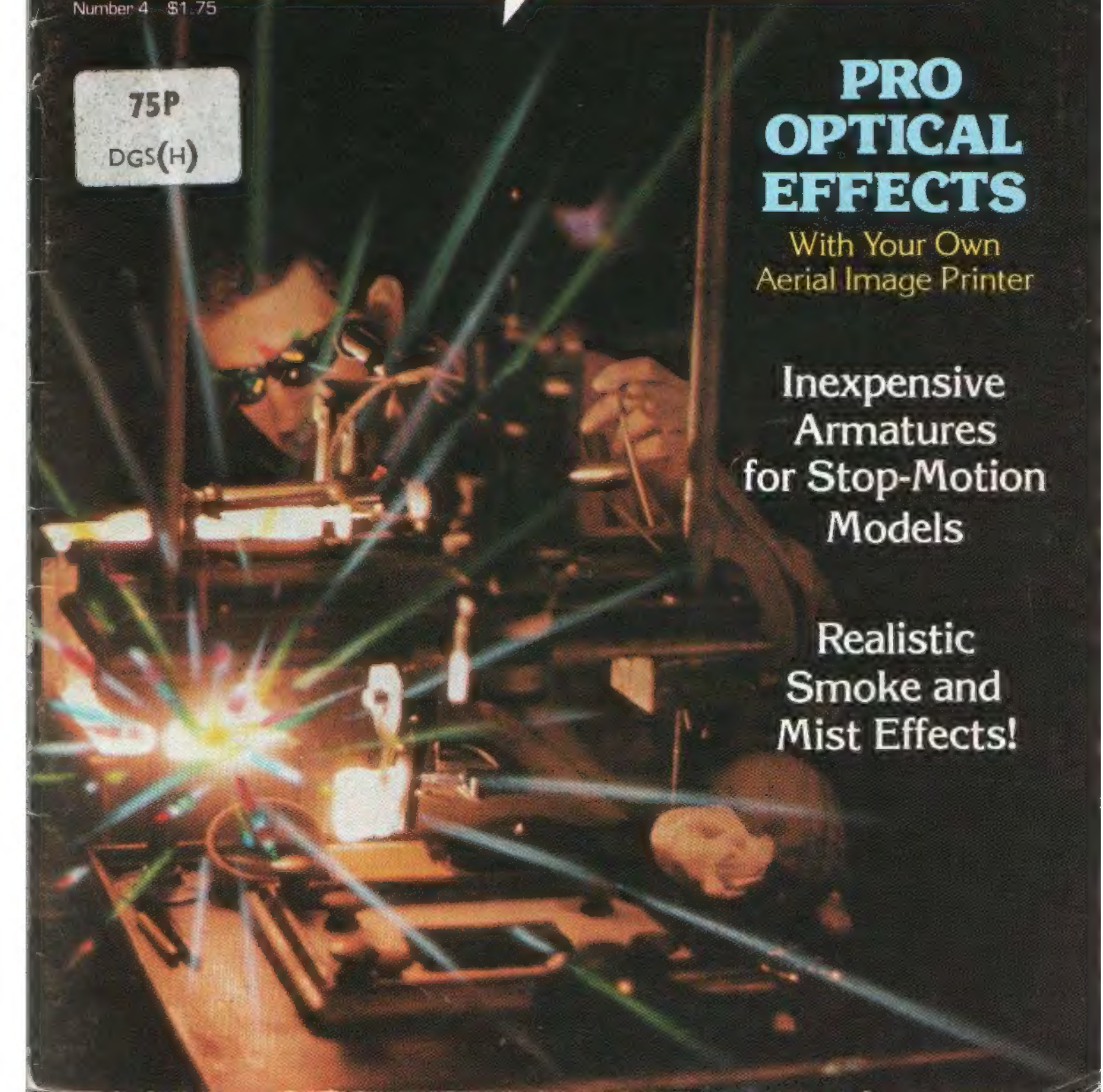

PRO OPTICAL EFFECTS

With Your Own Aerial Image Printer

Inexpensive Armatures for Stop-Motion Models

Realistic Smoke and Mist Effects!

Author and filmmaker John Cosentino with his homemade aerial image optical printer. In this issue, part one details the construction; next issue will conclude the article with a discussion of the various special effects that can be created with the printer.

Filmmakers' Forum (p.16) takes a look at some of our readers' ideas for producing special effects. Included are methods for laser beams, explosions and model techniques.

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Editor's Bench

Amateur Pitfalls

Recently, I dusted off some old 8mm movies I made when I was in high school. I showed them to several friends who watched with politeness and patience—but I was astonished at how *bad* my moviemaking ability was then. Whatever the good qualities, my work nevertheless showed all the weaknesses of a typical amateur filmmaker.

There are *three* main areas which I think are almost *always* the downfall of young filmmakers, and I want to describe these here:

1. **Writing**—Amateurs usually get excited about a *subject* for their film, *not* a story. They are usually not good writers, and they don't enlist the help of a friend who *is* and find another friend who is a good storyboard artist. They don't plan the drama scene-by-scene—devising clever surprises and building interesting characters.

As a result, their story is trite, dull, slow and characters try to keep a straight face while uttering dialogue copied from bad TV shows and made up on the set. Worst of all, amateur films have no *climax*—which is where the writer should *start*, and work backwards to the opening shot.

2. **Editing**—Amateurs usually have no editing plan when they *start* shooting (because they haven't worked out a storyboard), so after shooting, they find themselves with a pile of film and they start gluing pieces together the best way they can fit. They also tend to include *every shot* that came out in focus.

As a result, there are too many wide shots without a close-up to break the pace (or the opposite), and most shots go on and on—much too long, simply because the filmmaker could not bear to toss out a single foot of good film. The pace becomes deadly for everyone except those who worked on the film (who could watch their project for endless hours).

3. **Determining your scale**—Amateurs usually want to make *2001: A Space Odyssey*, but they can only work on weekends, and they just own one simple basic camera. They attempt special effects that are *far beyond* the capability of their equipment. They want a grand scale production, but all they have is fifty bucks in the budget.

As a result, their effects look fake and unconvincing, and they damage the overall impact of the drama—exactly the same way bad effects ruin Hollywood movies—only worse! The audience walks out saying, "The kid *thinks* big," but there is no doubt they have just seen an *amateur* production.

The reason that these three basic mistakes happen is usually because the filmmaker doesn't know any better, and his *real* interest is the *fun of* making the movie and attempting the effects. CINEMAGIC exists to help you have *more* than fun—to help you end up with a creation you can be *proud* of, without explanations.

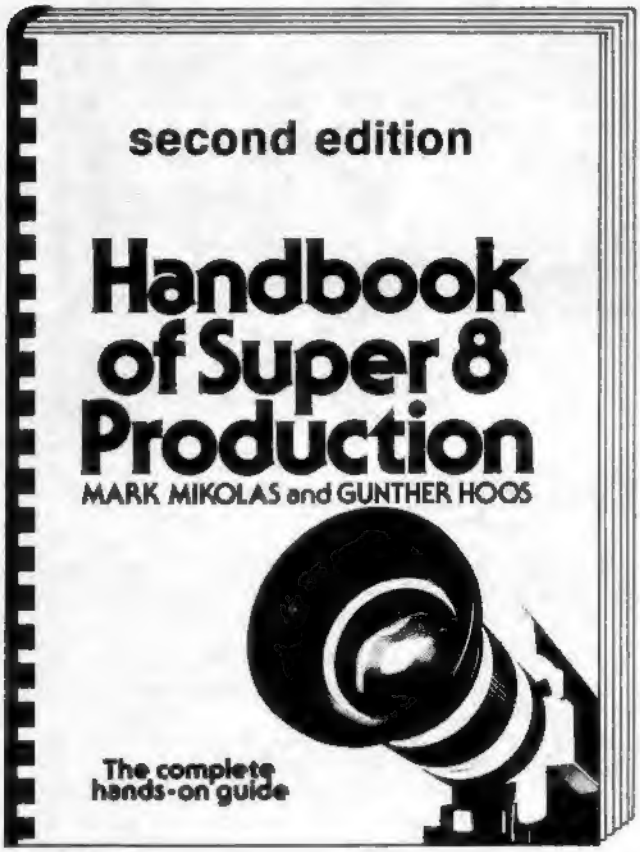
You must spend at least as much time planning and storyboarding your film as shooting it. You must ruthlessly cut and edit until you have a tight, exciting, well-paced film. And you must decide on a story idea in the first place that you can do *well* with the equipment and people available to you.

Take these typical amateur pitfalls seriously, and you are taking the first steps toward losing your amateur status.

—Kerry O'Quinn/Publisher

THE GUIDEBOOK FOR FILMMAKERS

The authoritative guide to Super 8 is back in a newly revised edition. With the latest equipment and prices, the latest systems and techniques for serious users of the Super 8 medium. And ... a sturdy spiral binding!



Handbook of Super 8 Production—the book that gives you Super 8 at its best—is back in a newly revised edition. Gunther Hoos and Mark Mikolas have brought their complete hands-on guide up-to-date with the changing technologies of Super 8 production—all the latest equipment, systems, techniques and prices are here, in more than 300 pages of information on everything in Super 8. And now, a sturdy spiral binding to make the Handbook even handier!

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"The Handbook's 312 pages contain just about everything there is to know about the craft and business of Super 8 filmmaking. It deserves the attention of anyone seriously interested in the present state and future prospects of professional Super 8 film production."—Matthew Fleury in Millimeter.

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"The most comprehensive book on Super 8. The authors, who are among the most knowledgeable of Super 8 filmmakers, describe the equipment that is available, tell how to select what's best for an individual's needs, and describe how to make inexpensive substitutes. More importantly, they detail how to use the equipment to its best advantage. It is an amazing compendium of information, much of it unavailable elsewhere, making this a book that is a must for any serious Super 8 filmmaker".—Elinor Stecker, Camera column, The New York Times.

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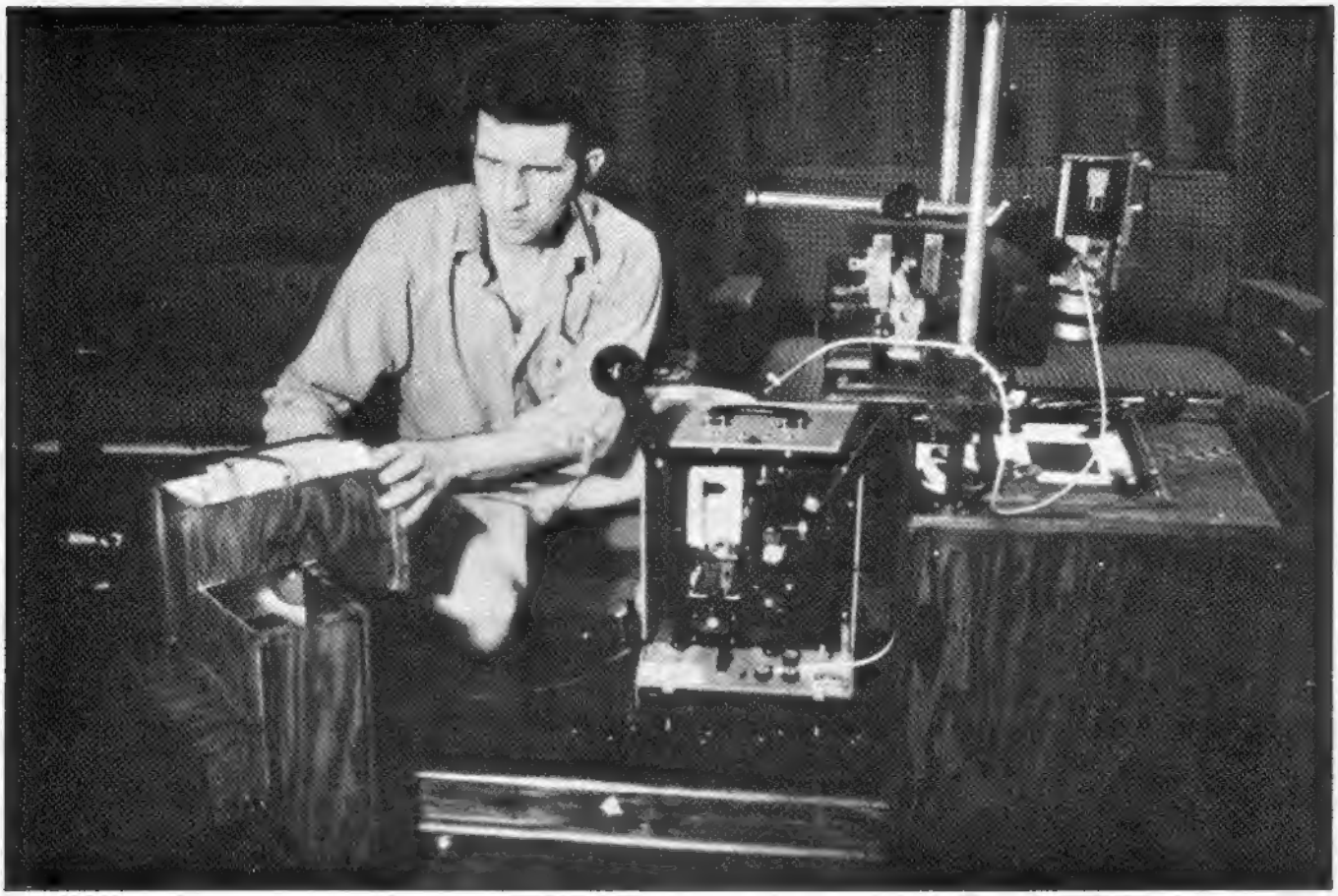


Aerial Image Optical Printer

By JOHN COSENTINO

The technique of rephotographing already-processed film to add a new element to the original image is called *optical printing* in cases where the original image is optically manipulated instead of rear or front screen projected. Optical printing is commonly used to add artwork to original footage.

Optical printing involves rephotographing an *aerially projected image* instead of a rear or front screen projected image. An *aerial image* is not focused on a screen, but at a designated point in space. This technique produces finer resolution than rear or front screen projection because there is no grainy screen to add to the degeneration of the original image. As is the case with rear and front screen projection, an aerially produced optical print is *second generation*.

The focal plane of an aerial image is in the same plane as the cel that contains the artwork that is being added to the frame. This may sound a little confusing, but think of it for a moment as a rear screen projection with an acetate cel laid on top. In the construction described here, the artwork lies horizontally instead of vertically, which differentiates it from most rear projection set-ups. Instead of a rear screen, the optical printing method substitutes a condenser lens at the focal plane of the projector.

The acetate cel that holds the artwork to be superimposed over the original footage rests on the flat side of the condenser lens instead of on a rear screen. Because both the acetate and the condenser lens are transparent, the image is not diffused at the focal plane of the projector and there is no grainy screen to distract from the sharpness of the original image.

The artwork on the acetate cel mattes out the rear-projected aerial image perfectly, because all the light that strikes the transparent acetate is transmitted into the camera lens while the light that strikes the opaque artwork is blocked by the artwork itself.

Above: John Cosentino, a regular contributor to CINEMAGIC, with his aerial image optical printer.

The condenser lens converges the aerial image back into a point of light and brings it into focus on the focal (film) plane of the camera. The camera must be positioned at the focal point of the condenser lens when the optical printer is calibrated during the final stages of construction.

It is possible to superimpose artwork onto the original footage in one pass through the optical printer. Multiple exposure effects are also commonly achieved through the use of an optical printer.

Television commercials use the optical printing method extensively. It is common to see cartoon characters interacting with live actors who are eating breakfast, drinking soda or performing a number of other mundane activities. The intrusion of fantasy cartoon characters into the dull life situa-

tions of the live actors in these commercials adds excitement to the products being advertised. If optical effects can make cereal seem exciting, imagine what they can do for your films!

The term "artwork" does not only apply to cartoon characters. Artwork can be animated explosions, laser beams, energy fields, paintings on acetate, photo cut-outs, titles and many other things. The only limit is the imagination of the filmmaker.

Artwork can even be three dimensional (like base relief figures). Because artwork is self-matting in an optical printer, only one pass of film through the camera is necessary to produce optical effects. This is probably the most useful aspect of optical printing for Super-8 filmmakers.

Although the possibilities for artwork/aerial image combinations are numerous, there are many kinds of effects that still require multiple exposures. Mattes are often required. This necessitates backwinding the film and reshooting. (See CINEMAGIC #1 for an article about backwinding.)

A "jiggly" matte line very quickly spoils the intended illusion by making it obvious that the scene is a special effect and not reality. Steady matte edges depend on accurate registration in both the camera and projector components of an optical printer.

Technically speaking, Super-8 equipment is not designed for precision multiple exposure matte effects. However, much Super-8 equipment can be adapted to yield pleasing results.

I successfully use a Cannon 814 camera and a Kodak M100 projector to do optical effects work. This particular model projector, which is no longer manufactured, has the advantage of a double claw pull-down registration mechanism that does a very good job of registering the film. However, most projectors that have a single claw pull-down produce a steady enough image for rephotography work. The new "capstan driven" projectors don't have a claw pull-down registration system and are not suitable for optical printing purposes.

Assuming that your equipment is satisfactory, there is no limit to the kinds of *static* mattes that you can produce with this optical printer.

I have attempted moving mattes with this printer, but it is my experience that the results don't justify the effort required for this technique. There is too much guesswork involved in deciding on a *specific frame* from which to begin the moving matte. It is a sobering experience, after spending many long hours rotoscoping, inking and filming to find that the finished moving matte is one frame out of synchronization.

Basic Equipment Required

The main components of the combination animation stand/optical printer are: a Super-8 camera, a condenser lens, a mirror and a Super-8 projector (see figure #1). The camera must have a reflex viewing system and, for convenience, it should have a through-the-lens CDS exposure meter with manual override. The camera must also have single-frame capabilities.

The projector must be able to accurately advance the film one frame at a time. The mirror must be front surface coated (sometimes called first surface), otherwise double images will occur.

How It Works

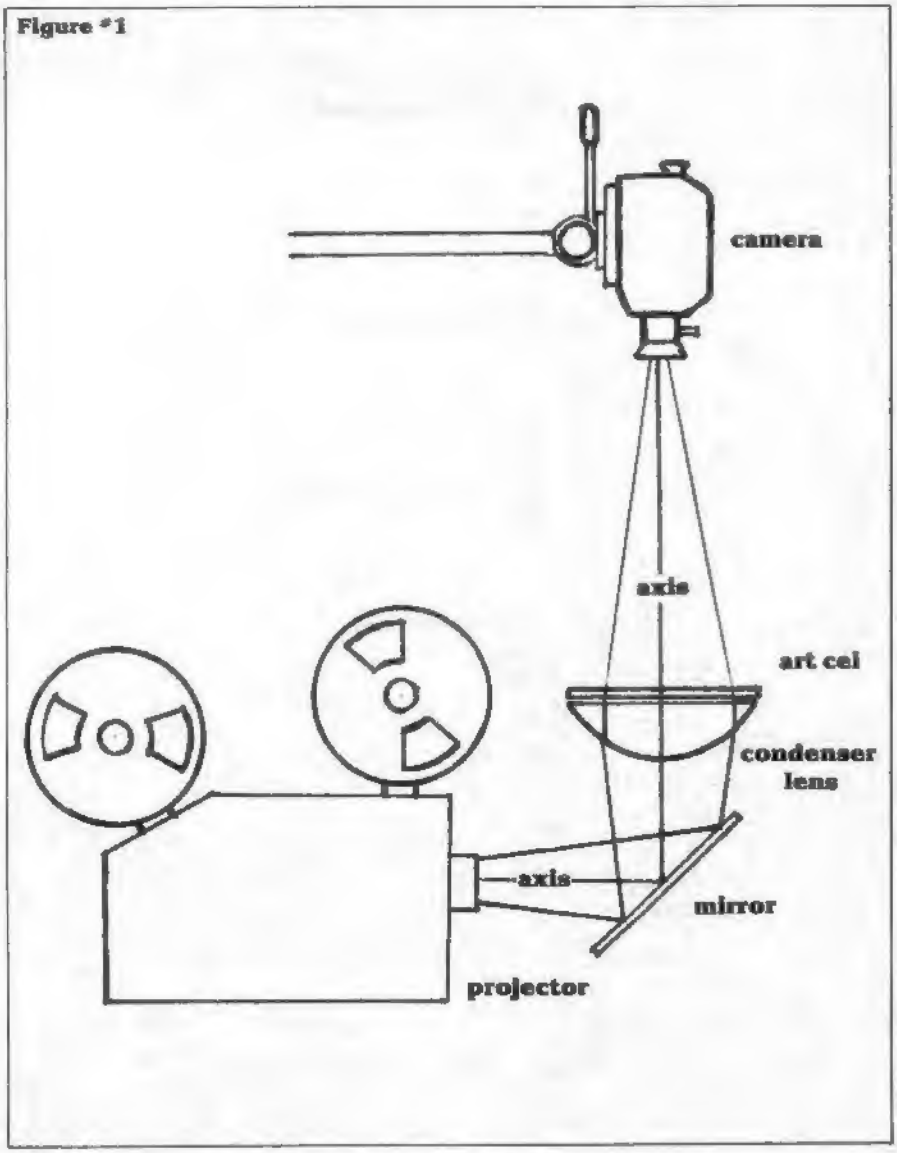
In its simplest form, this optical printer projects a Super-8 movie film image onto a mirror, through a condenser lens and into a Super-8 movie camera, where the image is refilmed.

The mirror is positioned at a 45 degree angle to the axes of all the component lens (projector, condenser and camera). The purpose of the mirror is to prevent the rear-projected aerial image from becoming reversed.

The aerial image expands until it reaches the condenser lens, which causes the image to reconverge until it reaches its focal point (where the camera is positioned). The aerial image is focused in the same plane as the artwork cel by means of a piece of tissue paper on top of the condenser lens. Focus the projector onto the tissue paper and the camera on the projector's image, then remove the tissue paper.

The camera does not record the aerial image in the same plane as the artwork because there is no screen to disperse the aerial image at this point. Instead, the aerial image continues to travel through the condenser lens and the transparent portions of the artwork cel and is re-focused at the focal (film) plane of the camera by the condenser lens. The projector, condenser lens and camera are all components in a com-

Figure #1



Aerial Image Optical Printer

plex, multiple lens optical system that share a common axis.

Artwork is placed on the flat side of the condenser lens, which is the base of a modified animation stand. The artwork mattes out the portions of the aerial image that fall behind it because the artwork is opaque and the cel that the artwork is on is transparent.

Mattes may be used in place of artwork. However, the use of mattes requires multiple exposures to complete the effect, which in turn requires backwinding and refilming.

When artwork is placed in the path of an aerial image (i.e., on the flat side of the condenser lens), it has a self-matting effect. The artwork appears as a black silhouette when viewed through the camera's viewfinder. Photoflood lamps or spotlights are necessary to light the artwork so it can be recorded by the camera. The photoflood lamps should be arranged in the same manner as for a regular animation stand. When the artwork is front-lit it becomes visible through the viewfinder and it will be recorded by the camera.

Exposure is determined by trial-and-error. Several test rolls will be necessary.

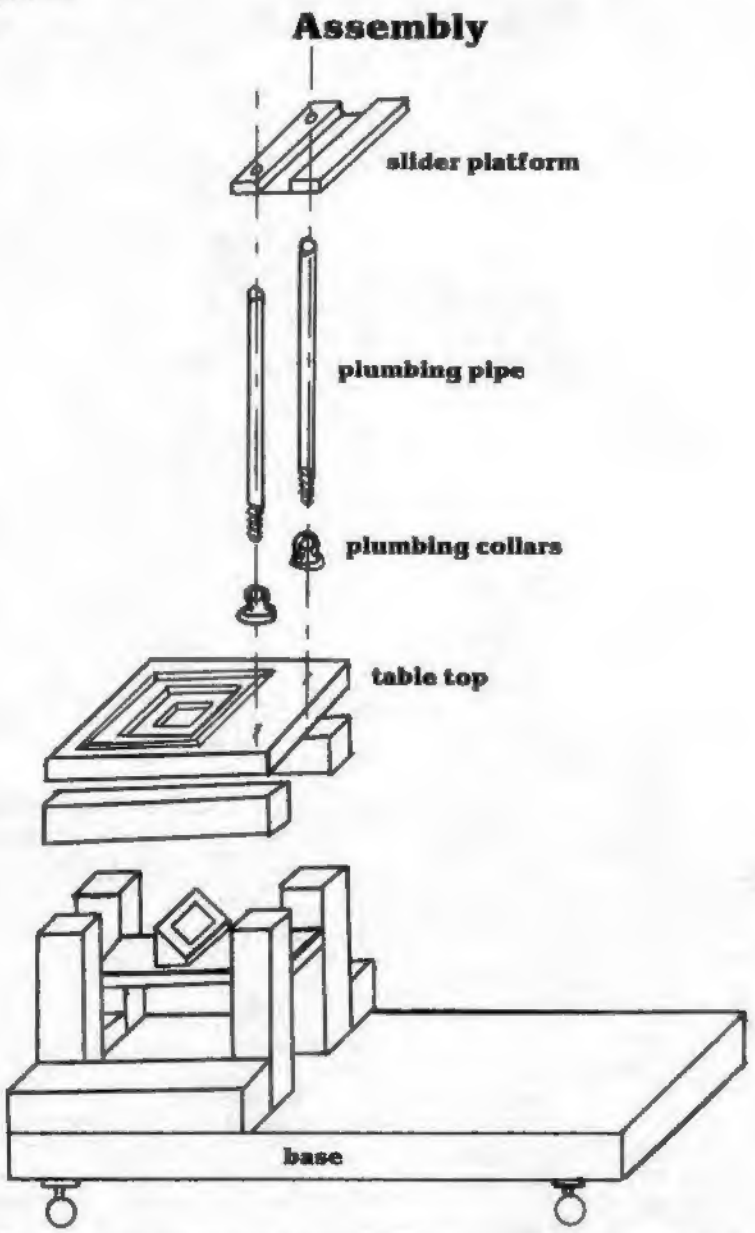
The aerial image will not be affected by the photo-flood lamps because they are placed above the condenser lens and the light that hits the transparent portion of the artwork cel and the condenser lens is transmitted down and away from the camera lens. Be sure to watch out for reflections, though.

The artwork and the aerial image can be recorded simultaneously in one pass through the camera because the floodlamps don't affect the aerial image and the aerial image doesn't affect the artwork, except that the artwork automatically mattes itself perfectly. And there is no grain from a rear projection screen!

Refilming on an optical printer is almost always done in single-frame. This makes the procedures time consuming, but if the camera and projector were simply turned on and left to run at 24 fps the result would be footage that pulsates in light intensity. The pulsating effect is only desirable in a very limited number of special effects. There are electronic synch devices for synching a camera and a projector at 24 fps, but they are expensive and impractical for this type of do-it-yourself optical printer.

Some technical manuals state that a zoom lens can not be used to rephotograph an aerial image. This statement can be misleading. The fact of the matter is that a zoom lens can be used, but for all practical purposes it can not be zoomed in or out while filming an aerial image. The lens should be set and locked onto a constant focal length, which is usually about 15mm for a Super-8 camera.

Figure #2



How Much Will It Cost to Build?

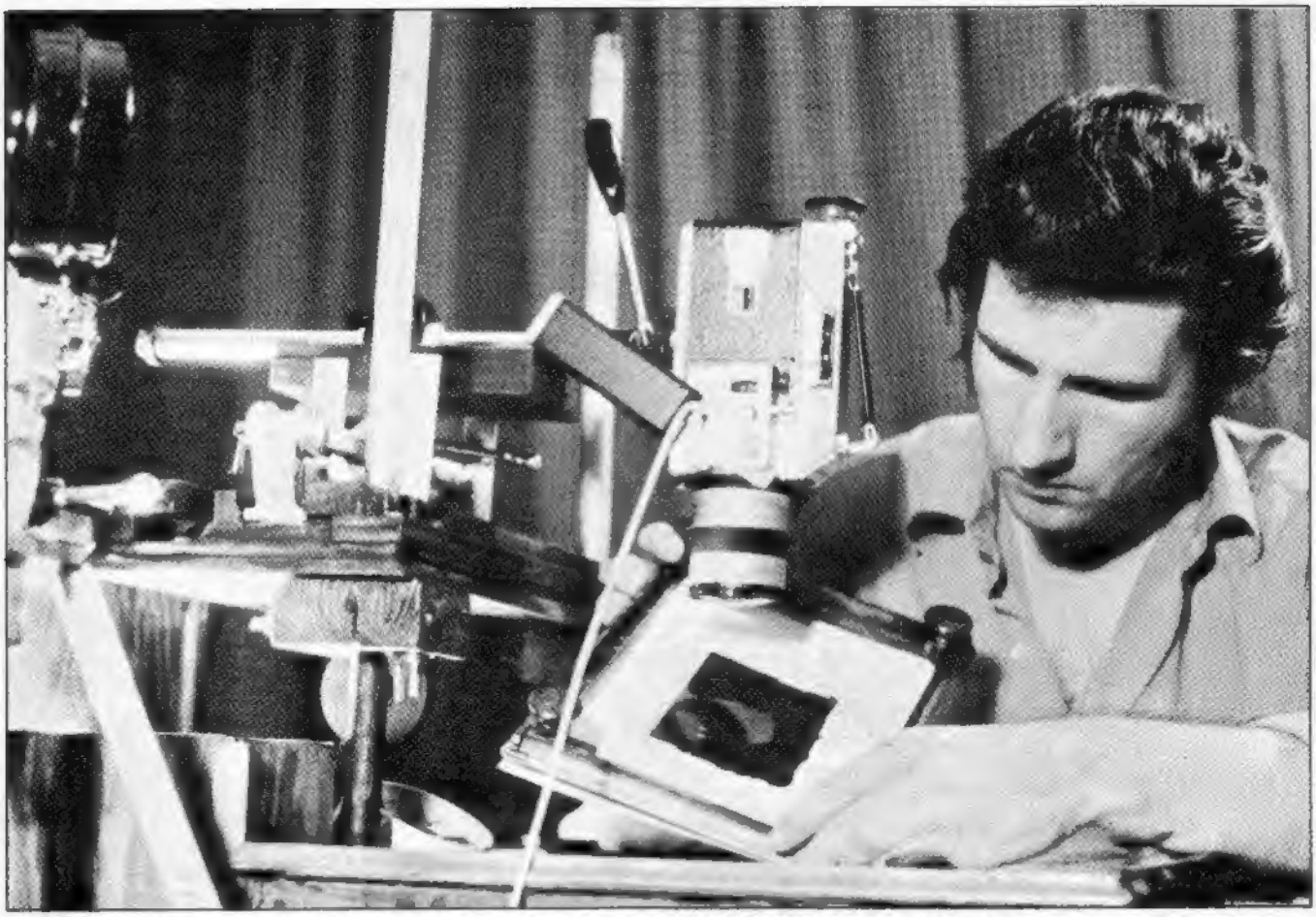
Excluding the camera and projector, the printer in this article cost me $50 to build. It was built five years ago using many materials which I had on hand. If you find it necessary to purchase all the materials, it will cost about $125. This is based on current prices (see supplies list). The cost can easily be driven up by making the printer larger, using machined parts and expensive condensers. Personally I prefer to make an inexpensive prototype (like this printer) and then to use it to learn which areas need improvement.

I have used the printer shown in this article to do many effects for *Paragon's Paragon* (which is my version of a *Star Trek*-type movie) and also wedding movies, with very good results.

The only change that I have considered making to the printer is adding a bigger and better quality condenser lens, which would make it much easier to draw mattes and do artwork effects. But it increases costs because there is an initial expense for the better lens and then continued expenses for the larger cel to draw on.

Edmund Scientific sells achromatic (color corrected) condenser lenses and also less expensive condensers which are not color corrected. Among their economy condensers are: a No. 70302 six-inch diameter lens for $39.50; and a No. 72337 nine-inch diameter lens for $89. Both of these are practical alternate choices for use in this printer. Their focal lengths appear to be short enough that only one lens would be needed.

Often the focal lengths of condenser lenses are too long (especially with achromatic lens) for use in a printer and therefore two of them must be



Checking mattes for registration is very important for a polished, finished effect. Note the two close-up lenses on the camera. Several neutral density filters may be necessary, depending on your light source.

placed together so that the focal length is cut in half. I cannot give specific formulas for calculating exactly what kind of focal length lens might be needed for this printer, but the information supplied should steer you in the right direction. Literature concerning optics is available in physics books at libraries or from Edmund Scientific.

The Results You Can Expect

The quality of the results obtained from a printer depend on the type of equipment used, the condenser lens, the alignment, the focus, the exposure and the kind of film that is used. This printer produces a movie dupe that looks like original footage shot on Ektachrome 160 type A movie film. This result will be achieved when KA 40 film is used for the master footage, which is placed in the printer's projector and aerially refilmed onto KA 40 film. A low-contrast master would rephotograph better, but it is not yet available in the pre-packaged 50-foot Super-8 film cartridges.

Because optical effects are second generation dupes, they tend to be slightly more contrasty, grainier and less sharp than the first-generation original footage they were obtained from. This difference in image quality is noticeable when the finished effect is edited into the movie. However, there are ways to "sneak" the special effect into a film.

One method of easing into an effect is to rephotograph footage before and after the effect. In this manner the exact moment that an effect is to occur will not be known to the audience because the mental distraction of associating a slight change in film quality with an effect is eliminated. How soon before or after an effect the film must be recopied is a matter of personal judgment.

Common sense and experience are the best guidelines. For example, the very beginning of a scene is the perfect place to start recopying the film so that when the effect occurs it is simply another shot within the scene. Logic dictates that the scene cannot be too long because the time and effort necessary to rephotograph an entire long scene would become unrealistic.

When long scenes are involved, I use a close-up shot of someone or something as my starting and stopping points. A close-up is a special kind of shot that seems to separate itself from the mainstream of action. It therefore works well as a place to begin and finish recopying film, before and after the special-effects segments.

My *Paragon's Paragon* was all shot on KA 40 movie film, except for certain footage which was used for types of special effects not discussed in this article. This use of a common film stock for both the first unit and the effects masters caused the emulsion matching difficulties just mentioned. This problem can be minimized by shooting the first unit with Ektachrome 160 type A film and the effects masters on KA 40 type A film.

The effects masters will be copied when the effects are added. The resulting effects footage will more closely resemble the quality of first unit footage. The two films will naturally blend better during editing. No matter what method is used to combine the printer opticals with the first unit footage, if common sense and experience are used, the result should be acceptable to anyone but a nit-picker.

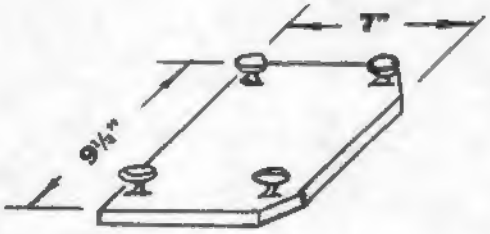
Construction and Assembly of the Printer

In order to get an overall view of this project it would be beneficial to look at the assembly drawings of the printer and also the finished result (See figures 2 & 3). Custom adjustments may be required to suit your own equipment.

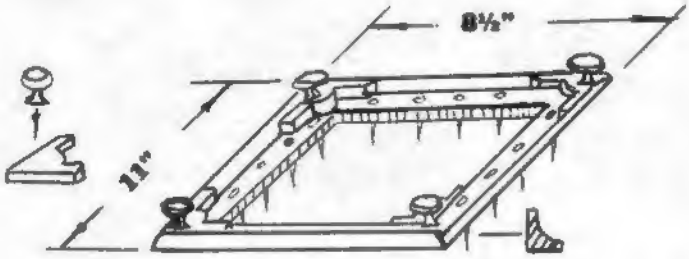
I suggest that a demonstration printer be set up if you are considering building a printer (see figure #4). This

Figure #3

Table Top and Components

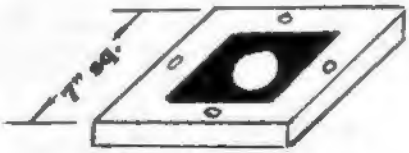


glass weight

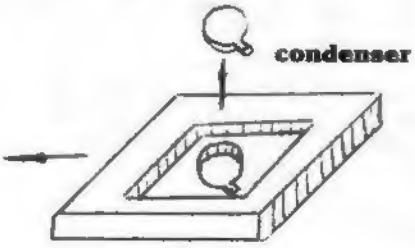


* registration device

glass



lens plate



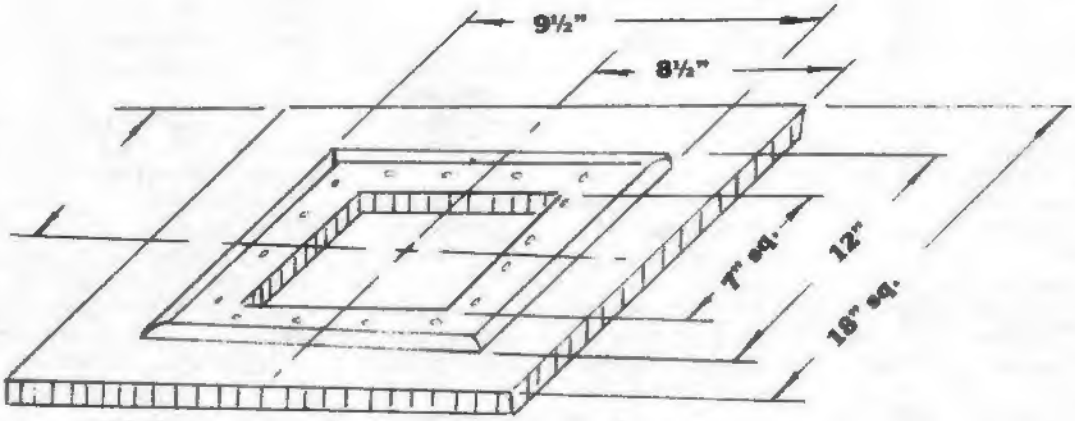
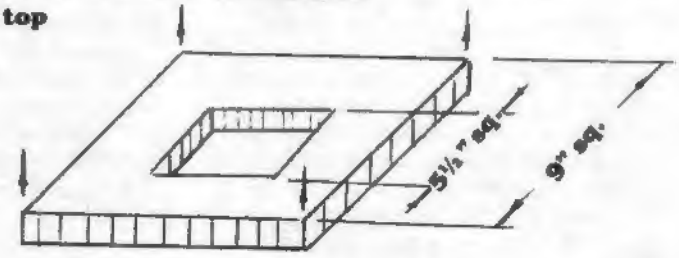


table top



Here I am working on mattes for my film, *Paragon's Paragon*. Twenty-four mattes are required for one second of finished film effect.

will enable you to very quickly and easily see an aerial image. All that is needed is a camera, a projector and a condenser lens (magnifying glass).

The projector lens, magnifying glass and camera lens are all lined up in one straight line (a common axis). The camera is focused on the magnifying glass (close-up lenses may be needed here), and the projector's image is focused on the condenser lens by holding a piece of paper on the condenser. Polarizing (neutral density) filters are needed over the camera lens in order to look at the very bright image. Set the projector to "still" ("freeze frame") position, remove the paper and the image should be visible and in focus. If not, simply readjust the alignment until the image becomes focused and visible.

I would like to make a few comments concerning the actual assembly and construction of the printer. Rather than writing a step-by-step, nail-this-to-that kind of article, I have supplied drawings and supporting comments. The materials list also supplies construction data. And because a printer must conform to individual needs and equipment, I have not included every single detail.

One thing that should be pointed out is that *the mirror should not be permanently anchored in place until the printer has been aligned.* It may be necessary to tip, tilt or turn the mirror.

Many details are not included concerning the "slider platform," because its size will vary according to individual needs (see figure #5). In my case tripods were used to obtain movement in all directions. Their legs were broken, rendering them unusable for normal camera work. The slider platform acts as an alignment device to zero in on the aerial image and help calibrate the camera position.

For approximately $100 a "two-axis macro-focus adjust" can be purchased and used as the alignment device. (It is available from Berkley Marketing Companies, 25-20 Brooklyn Queens Expressway West, Woodside, New York 11377, or Berkley Marketing Co., 1011 Chestnut Street, Burbank, California 91506. Send them a S.A.S.E. for literature.) This macro adjust allows about one-and-one-half inches of travel in two directions.

The tripod system allows three inches travel, but neither method is adequate for animated camera movement.

Constructing a Light Source

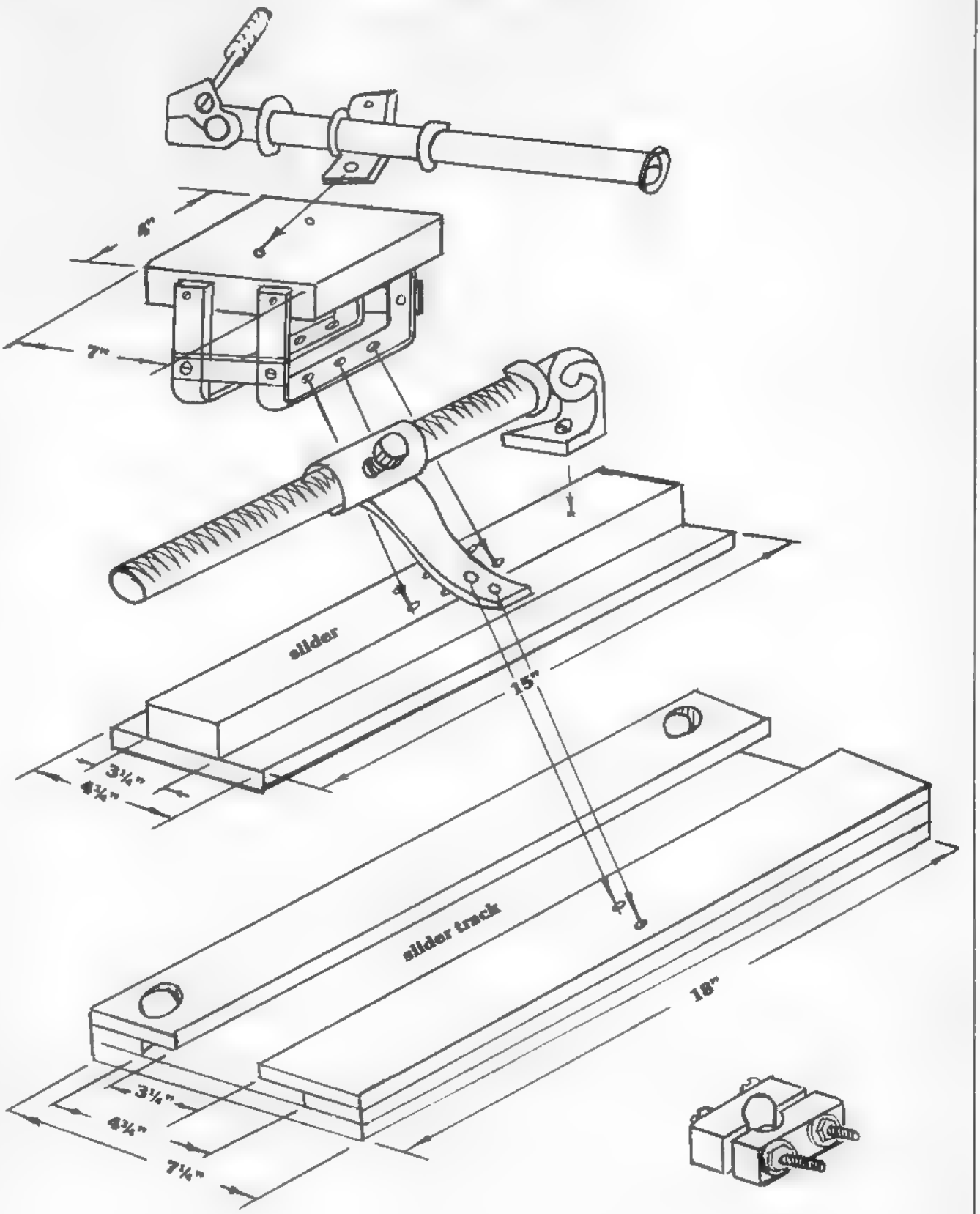
The projector's bulb creates too bright an aerial image and its heat shield distorts the image. The heat shield must be moved out of the way and the bulb must be taken out so that another light source can be supplied. I decided on bounce, instead of direct, lighting.

In order to bounce the light through the movie film within the projector's gate, I constructed a large wooden box which surrounded the back half of the projector. The interior of it is painted flat white. The contours of my projector were obtained by the trial and error cutting and fitting of cardboard to it. The cardboard template was used to make the wooden box.

I use a 650-watt quartz 3400° K. movie light (standard for Super-8). A blower is clamped to a tripod and used to cool the film and the light. Sometimes light will leak out of the front of the box and cause flares on the aerial image, but cloth (or black tape) stuffed into the crack solves this

Figure #5

Slider Platform



problem.

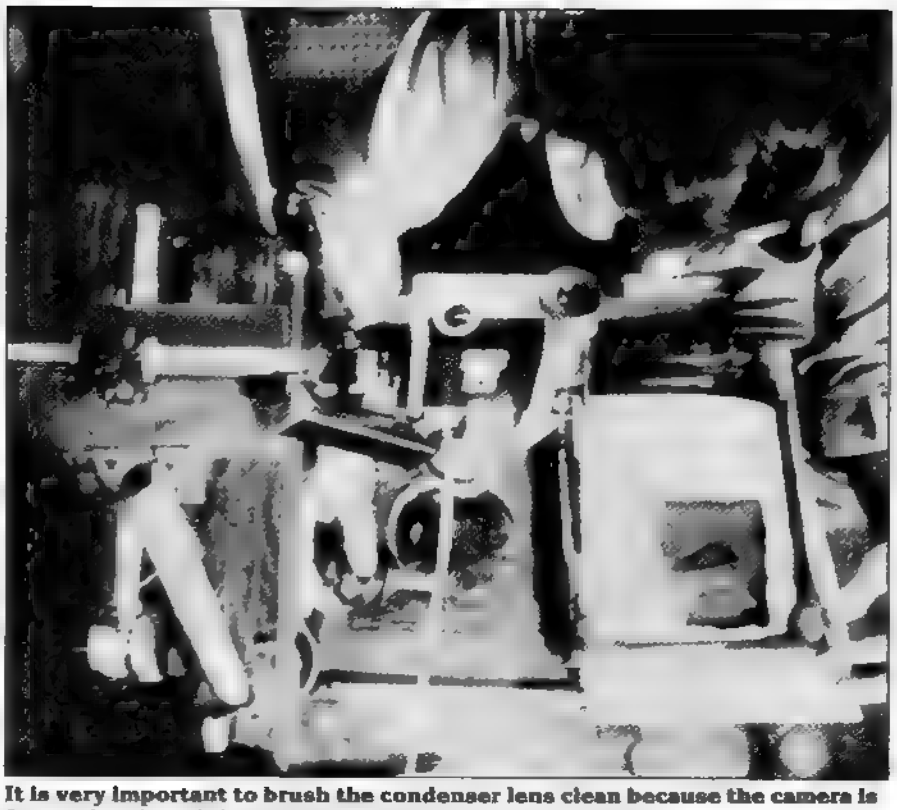
This "light box" method is clumsy and inefficient, but it is also *inexpensive*. If you are familiar with optics, you should probably design a direct light source for your own unit.

Color Correction Filter Packs

Color correction filters are used to adjust the colors of the refilmed image. When more than one filter is used it is called a *filter pack*. Filters usually give the best results (do not distort the image) when they are placed between the light source and the film. Color Correction (CC), or Color Printing (CP) filters can be used. The CC filters are of better quality and, naturally, cost more.

When using the General No. 545 Condenser Lens and KA 40 movie films in the camera and in the projector, I have found the most common filter pack consists of a 10 blue and a 30 magenta. Besides these two filters, other colors should eventually be obtained, such as a 5 blue, magenta, cyan and yellow. Kodak has a data guide which explains the color shifts obtained by adding or subtracting specific filters.

Although the Kodak book explains the effects of colored filters it cannot tell you what *your* exact results are going to be. The painstaking process of trial and error must be applied. Sometimes, color shifts occur between dif ferent rolls of film. Voltage shifts during different times of the day can cause the lights to burn at slightly different color temperatures, but I have found these problems to be minimal. The 10 blue and 30 magenta have been a very consistent filter pack for me over the years. Once you find a basic filter pack, perhaps you will be as lucky.



It is very important to brush the condenser lens clean because the camera is focused on it and the artwork. Dirt will ruin the effect.

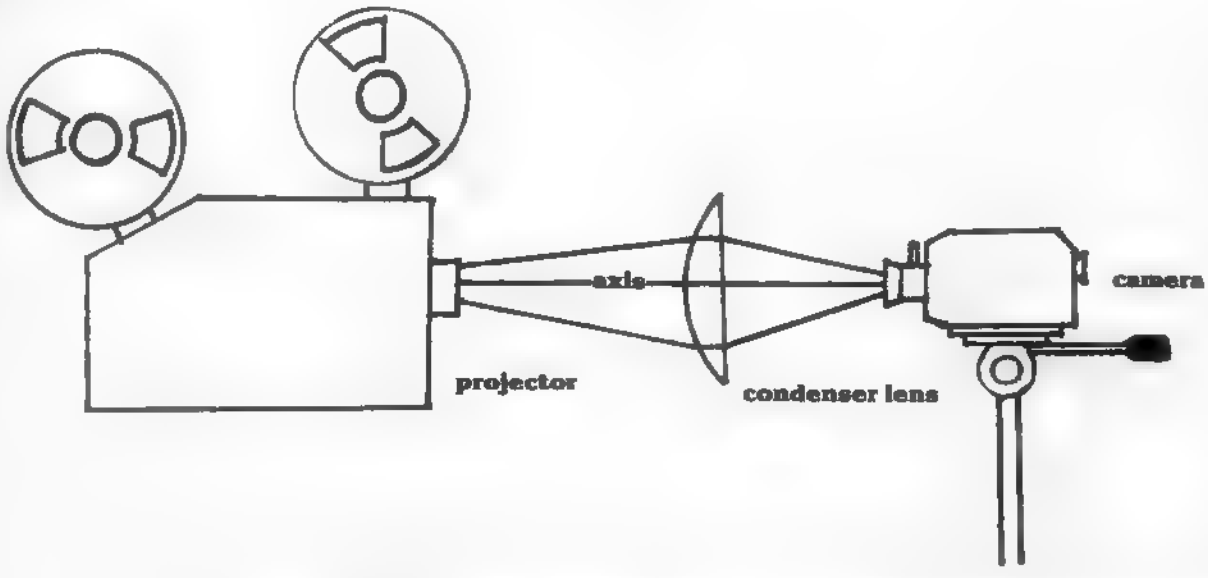
Aligning the Printer

Alignment of any optical printer is critical and usually time-consuming. The projector lens, mirror, condenser lens and camera lens become as one optical system. This particular printer has no specific alignment plan, but a general outline is needed (see figure #6).

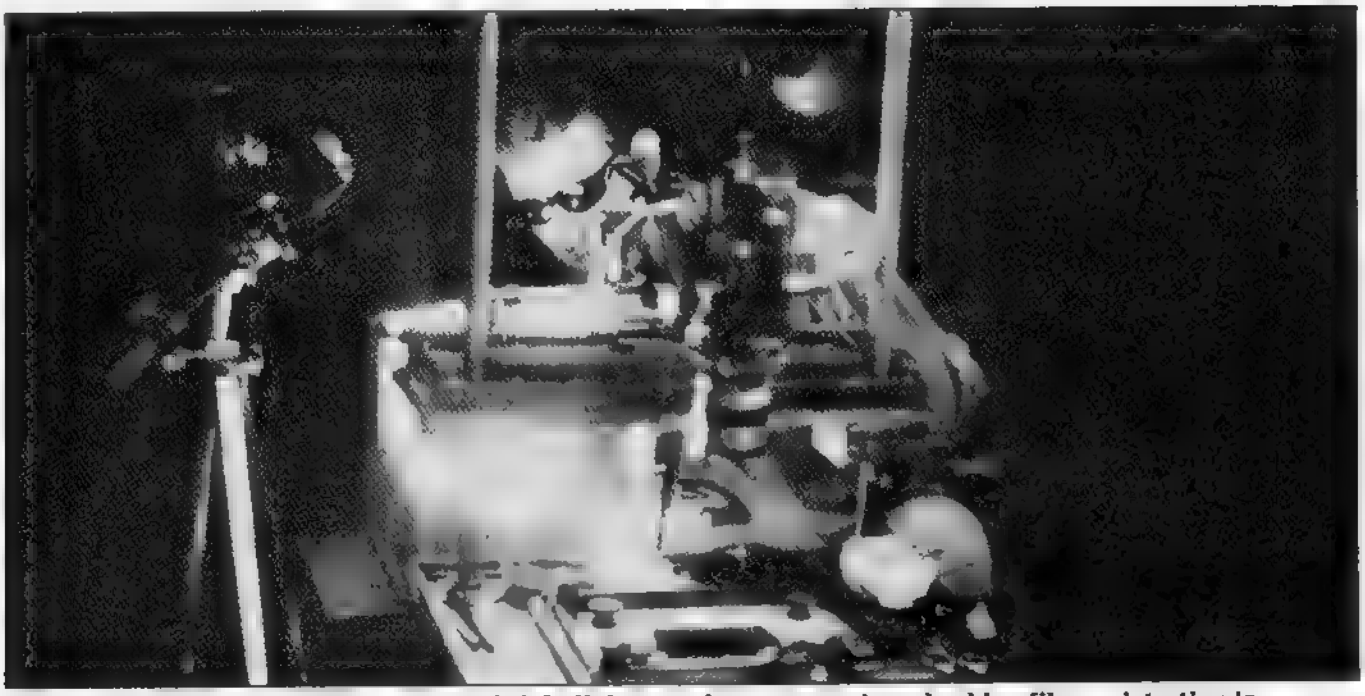
Begin with the assumption that the axis of the projector lens is parallel to the base, that the mirror is at a 45° angle to the axis of the condenser lens, the camera lens, the projector lens and to the base. The axis of the condenser is perpendicular to the base. These things should be taken care of during the actual construction of the printer, but they may need to be adjusted as a last resort if difficulties arise during the alignment of the printer.

To begin aligning the printer, a piece of master footage is placed into the projector and projected (still frame) onto the mirror and focused on the *upper* surface of the condenser lens. The focusing is actually done on a piece of

Figure #4



Simple set-up for viewing a reversed aerial image.



You should wear sunglasses to keep the bright light out of your eyes when checking film registration in the projector. This is how the printer looks during actual re-copying. Note the ventilation blower.

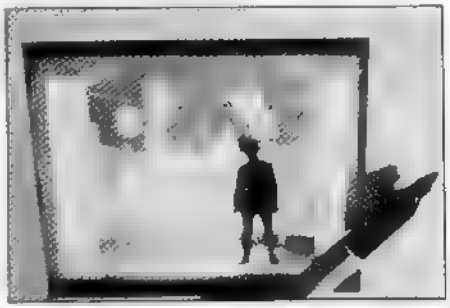
foggy acetate, mylar or tissue paper placed on top of the condenser lens; otherwise, the image simply passes through the lens and cannot be seen. The center of the projected image should be at the center of the condenser lens, and the four corners of the projected image should touch the circular edges of the condenser.

Next, the camera is focused on the rear projected aerial image. My camera required a +5 close-up lens. The focal length of the zoom lens was set to 18mm. The rear projection screen (the foggy acetate) is removed and the aerial image is visible through the camera's eyepiece. It is now that the trial-and-error procedure begins, because the aerial image must be precisely aligned.

The camera zoom may have to be changed slightly to get rid of dark edges, or it may have to be centered left or right, or tilted. The same applies to the projector. Eventually, after these adjustments are made, the image will be properly aligned.

During these alignment procedures I use the projector's bulb and put its heat shield back in place. By doing this the rear projected image is bright and clear. But the aerial image will be too bright if the regular projector bulb is used during filming. After the back projection material is removed from the condenser, two polarizing filters must be placed in front of the camera lens. By rotating the polarizers, the light intensity can be adjusted so that the aerial image can be seen easily.

(end of part I)

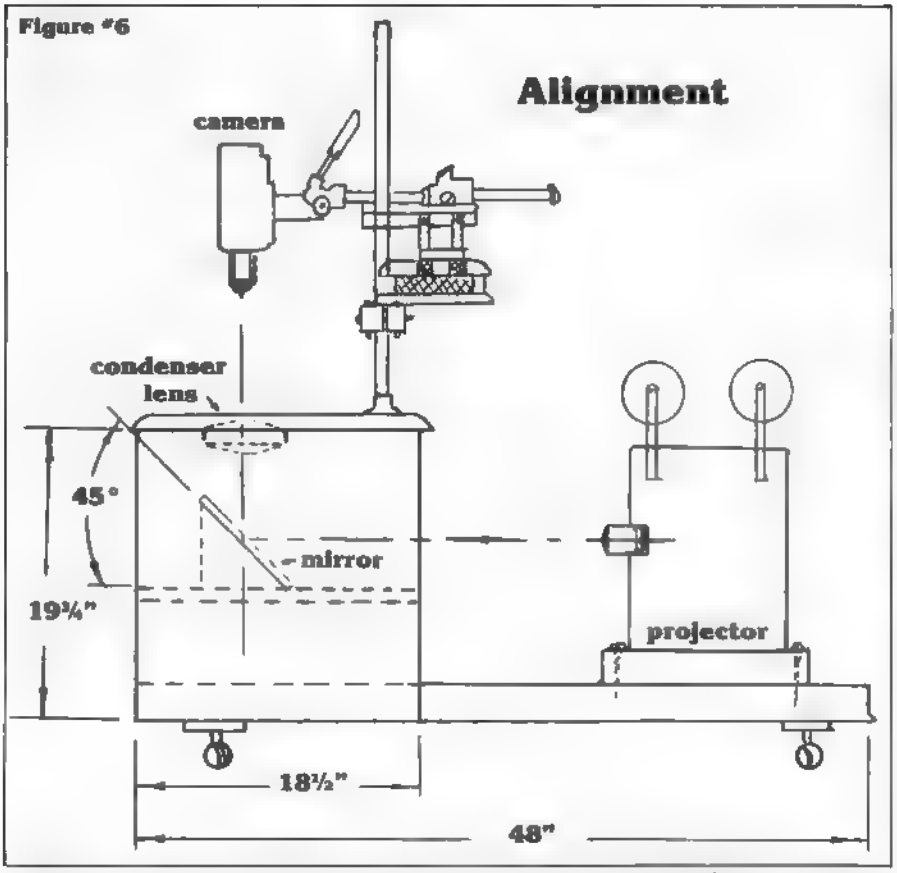


A matte from *Paragon's Paragon.*

PARTS

Edmund Scientific Company **101 Gloucester Pike** **Barrington, NJ 08007** **send for free catalog**	1 front surface mirror—5"x7"	$ 5.00
Photo Equipment Store	1 +10 blue CC filter	$ 5.00
	1 +30 magenta CC filter	$ 5.00
Surplus Electrical Supply Store (or Edmund Scientific)	1 small blower	$ 5.00
Hardware Store	8 drawer knobs, 1" dia.	$ 4.00
	2 threaded plumbing pipes, ¾" dia., two feet long	$ 4.00
	1 piece of glass 1/16"x7"x9" (glass holds artwork down for filming)	$ .50
	1 piece of glass 1/16"x3⅛"x4⅛" (this piece of glass is a rear-screen projection plate)	$ .50
	1 piece of glass, ⅛"x7"x7" (larger rear-screen projection plate)	$ .50
	4 "U" shaped metal braces, ¾" wide, 4" long, ⅛" thick (for slider platform)	$ 3.00
	2 metal cross braces, 4" long, ⅛" thick, ¾" wide (for slider platform)	$ .50
	1 Elmer's glue	$ 2.00
	1 pint of stain	$ 2.00

Figure #6



This diagram shows the actual dimensions of my optical printer. You may decide to alter dimensions slightly, depending on your equipment.

Lumber Yard	40 feet of shoe molding (½"x½" for trim)	$10.00
	4 feet of corner molding (¾"x¾" for the cel punch)	$ 2.00
	1 piece of 4'x8' plywood (½" thick, smooth on one side for the base)	$12.00
	1 piece of ¼" thick, 4'x8' plywood (smooth on one side for the sides of the printer)	$ 9.00
	3 eight foot long two by fours, (for the base of the framework)	$ 5.00
	1 eight foot long one by two (for shelf supports)	$ 1.50
Newspaper Ads— Used Equipment	2 tripods	$10.00
Discount Store	4 shepard casters, 2½" dia.	$10.00
	2 jars black poster paint for mattes	$ 1.00
	10 black, felt-tipped marking pens	$ 7.00
Ash Tool and Die Supplies Ash Mail Order Company 650 East Mandoline Madison Heights, MI 48071	1 No. 545 "general" reading glass, 4½" dia.	$10.66 plus postage
Plastic Materials Supply Company	1 2'x4' piece of thin clear mylar for the cels	$ 3.00
	approximate total cost	$126.00

Filmmakers' Forum

A regular department devoted to readers' comments about filmmaking, their problems and solutions.

Safe Explosion FX

We are concerned that the majority of our readers who responded to our request for tips on how to "roll your own" explosions (STARLOG #20) included in their suggestions the use of real explosives. We were asking for tips on how to create safe explosion effects without the use of real explosives. Some of the suggestions that we received were very dangerous and we hope that our readers will stop experimenting with dangerous materials. If you play with fire, you might get burned.

Don't use firecrackers, gasoline or any similar materials. Fireworks are illegal in most parts of the U.S. because they cause many injuries every year. It's not worth getting hurt.

Real explosions don't produce realistic effects with miniatures because the speed of the explosion is not in scale with the size of the model. High-speed cameras are necessary to realistically record explosions with miniatures, so that the projected image is drastically slowed down. The Death Star explosion in Star Wars was filmed at 300 fps. This type of ultra slow motion is unavailable in the Super-8 format.

Please take note of the following letter. It says more about the dangers of experimenting with real explosives than we could possibly hope to say ourselves.
The Editors

. . . I have a story that might be of interest to you and your readers. Like many of your readers, I am a science-fiction enthusiast and filmmaker. I have read your article on special effect explosions in STARLOG #17. I had a very explosive reaction to the articles and my interest in the subject got the best of me.

Like many of your readers, I had the idea to fool around with explosive compounds. I have quite a bit of knowledge of chemistry, but knowledge didn't stop an accident from happening.

I was working on a small charge of gunpowder. It exploded prematurely, and nearly took my life. I was lucky and sustained only minor injuries to my chest and hands. Please tell your readers to be extremely careful with explosives of any type. It's fun to make films, but it's not worth your life!

David Sipmann
Twin Lakes, MI

Fish Tank Explosions

. First find a five-to-six gallon fish tank that nobody wants. Drill a ¼" hole in the back of the tank (If the back of the tank is glass, knock it out and replace it with a piece of plywood.) Paint the back of the tank black. Purchase a 25cc syringe from a pharmacy or get one from your doctor.

Cut the end of the syringe so that it fits in the hole. Seal the edges with glue. Fill the syringe with milk, paint or what ever you think would look best. (Your mixture must be thick so that it flows together in the water.) For an added effect, put some glitter in your mixture.

Scrub the front of the tank, fill it with water and set it up for filming. Have a friend squeeze the liquid into the tank while you film.

This footage can be spliced or superimposed with a shot of your spaceship. This way of making explosions is not dangerous like firecrackers or gunpowder and the effect is much better.

Trent Campbell
Duluth, MN

This technique can also be done with day-glow paint and a blacklight.

Flashbulb Explosions

I have some ways to make safe miniature explosions. For total destruction I: 1) color over the object to be destroyed with an orange felt-tipped pen for a glowing effect; 2) film a flashbulb going off an inch or two from the lens.

To show internal damage to a spaceship I build a low-voltage resistor into the detail and wire it to a train set transformer. I then film the resistor being overloaded. With editing, these techniques will provide a safe and realistic explosion effect for miniatures.

Steven Chapman
Stone Mtn., GA

Styrofoam Debris

. . . I have found an easy way to make miniature explosions without using dangerous substances.

Take a 5' square board and drill a 1" hole in the middle. Take the same size black cloth and glue glitter on it for stars. Stretch the cloth tight over the board and tack it down.

Cut a hole in the cloth where the drilled hole is located. Glue black cloth and glitter on one side of a piece of cardboard 1' wide and 3' long. Cut a slit on one edge of the cloth on the board so that the cardboard can slide between the board and cloth.

Nail foot-long boards to the back of the board so it looks like an upside-down table. Nail the entire assembly to the ceiling so the black side is facing down.

Cut out the bottom of a Dixie cup and glue the small end around the hole on the back of the board. Put debris in the cup. For debris I use three things—glitter, talcum and small pieces of styrofoam (the kind made of little balls).

Put the camera under the set up so that it is looking up at the black side of the board. Start the camera and pull the cardboard out so the debris in the cup falls toward the camera. Film in slow motion for best results.

Stephen V. Cisco
Bejou, MN

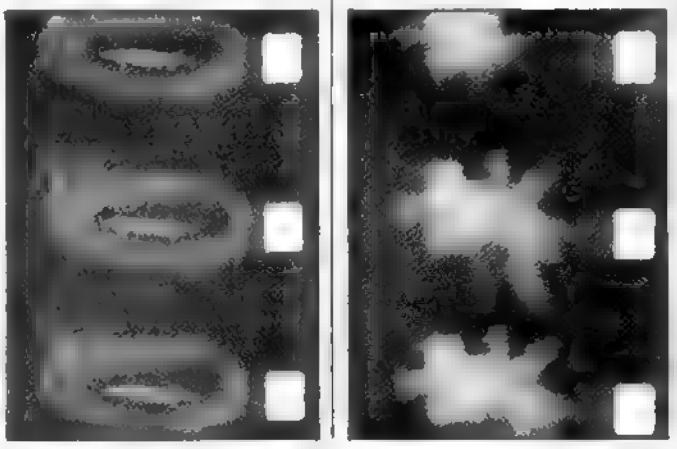
Paint-on Explosions

. . . One way of creating explosions is the paint-on method. First, set up the shot, a spaceship hanging in the void. Next, place a filter on the camera lens. Shoot a few frames. Then, with a paintbrush, paint a smudge on the filter, covering the position of the model (check the viewfinder). Click a few frames as you keep increasing the size of the smudge. Remove your model, and aim a movie light right into your lens for a few frames. Next, wipe away the smudge and animate the gradual disappearance. On the film, with a laser scratch in, your ship will get zapped. A gaseous cloud emerges, a sudden flash and the ship is destroyed. . . .

Craig Silvia
Princeton, NJ

. . I was wondering where I could get any information about body explosions. Or any information about bullet or car explosions.

George Campeau
Taylor, MI



Craig Silvia's paint-on explosions.

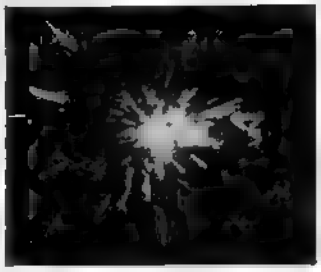
Budget Saver—Garage Sales

. . A problem which plagued me as a young filmmaker was the expense of tools and materials. If you're an animator, miniaturist, special effects man-to-be and you're constantly buying tools and materials you need, stop!

A sure-fire method of cutting down on your budget is to pick up the items you need second hand. Often, good materials and tools can be picked up at garage sales, flea markets and the like for practically nothing. From now on, think twice before you pay the retail price!

Carl Paolino
Maspeth, NY

Sparkler FX



. In issue #20 you asked for explosion ideas. One very safe and simple method produces a surprising result. Try superimposing a sparkler over a model. This will look like part of the ship is exploding. Different colored filters or pieces of plastic over the lens will tint the explosion.

Maurice Tremblay
Manchester, NH

Front Projection

. I have just started making animated films. In the old CINEMAGIC #11, there was an article about front projection. Thirty-five millimeter slides work very well; I have not tried the method with the Kodak Anylist II projector yet because I can't find one. Do you know where I could borrow, rent or buy one? (If it is not too expensive.) Are there any other projectors with this specialized feature in Super-8? I would appreciate any help you could give me!

Doug Trainor
Silver Spring, MD

Stick to 35mm slides, Doug. They yield much higher quality resolution.

Cheap Blisters

. One of the problems that I ran across in a recent film was how to produce realistic blisters cheaply enough to make them for a large number of people. I finally found the answer from a makeup team working on a disaster simulation.

All you need is a jar of Vaseline and some tissue paper. Simply place a dab of Vaseline where you want the blister. The more Vaseline you use, the larger the blister.

Now tear a piece of tissue paper in a circular shape big enough to cover the Vaseline. (If the tissue paper is two-ply, separate the layers and use only one.) Place the tissue over the Vaseline and blend in the edges by smearing on some more Vaseline. You now have a whitish "blister" that with a little adjusting can be shaped any way you like. Experiment and find ways to modify these "blisters" to fit your own needs.

Bob West, Jr.
Benicia, CA

Liquid Latex

. . . I have thousands of questions to ask, but right now I will ask you to suffer through only one. What is slush molding?

Herb Balch
Indianapolis, IN

Slush molding is a method of casting pliable forms with liquid latex. First, sculpt a full-size model of the object to be slush molded out of modeling clay. Next, pour plaster of paris all around the clay model, except at the base. (Try to contain the plaster of paris within a vessel large enough to make a strong mold. Try using a gallon-size open-ended milk carton.) After the plaster has set, scrape out all the clay. You now have a negative mold. The final step is to pour liquid latex into the mold and "slush" it around so that the latex fills up every crevice in the mold and makes a thin layer that covers the entire surface inside the mold. Several layers may be built up in this manner, allowing each layer time to dry. The latex should be at least 1/8" thick before being removed from the mold. You now have a slush-molded object. This technique is good for over-the-head latex masks and has many other applications.

Wanted: Correspondence

I am interested in amateur or professional filmmakers in my area who can benefit from an exchange correspondence about working on films. I would like to see their work and maybe combine efforts in making films.

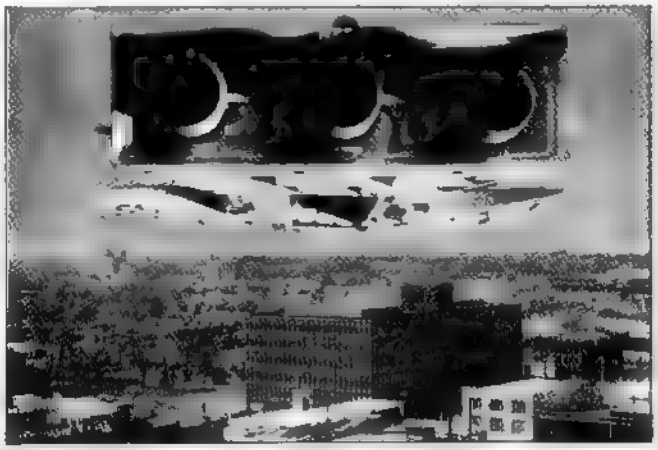
Charles Voner
11 Brown Place
Woburn, MA 01801

Ogden, Utah, Invaded!

. Here is a picture that I made at school for my photography portfolio. I achieved the effect by taking a picture from the top of a downtown (Ogden, Utah) building and superimposing a picture I took of a model I built onto the first picture in the darkroom.

I built the model out of plexi glass and small model parts. The model is 18 inches long. This is the back end of the model, showing the rocket engines. I called the photo "Invasion."

Randall Ottesen
Ogden, UT



Randall Ottesen's spaceship over Ogden.

Laser Test

Here is a photo I created by using some of the explosion tips in Starlog #17. It is a picture of a starfighter testing out its laser cannon on the surface of a barren planet. I used a 35mm SLR to get a clear image that could be printed.

Michael C. Smith
P.O. Box 504
Coldwater, Michigan 49036

Michael Smith's fantastic laser effects.

Indoor Landscapes

For animators who want to film a small creature in an outdoor setting, but don't want the moving sun to spoil their hard earned footage, the best method is to film indoors with realistic settings made of cardboard, plaster and other easy-to-get materials.

First, sketch out the way you want the set to look from ground level and above. Next, get a piece of wood or masonite of the proper size and sketch the top of it. If there are any areas that must rise more than a fraction of an inch, pieces of wood or styrofoam should be glued to that area until it is of the proper size and height.

If there are any large hills or cliffs they can be made out of cardboard or chicken wire. If the animated creature is supposed to walk on these hills or mountains they can be made out of wood or large rocks.

The ground work for such a set is made of plaster and rocks from your backyard or a nearby gravel pit. Sand mixed with plaster makes a great texture. After covering the base with plaster and arranging the rocks the way you want them to look, cover the rocks with a thin layer of plaster and add any plants you need before the plaster dries.

The set should be painted with thin washes of acrylic paints (although other mediums work well, too). The set should have a base coat of a very thin layer of a blackish-tan color. Shading can be made with a darker version of the basecoat and highlighted with tan, light tan and finally white mixed with a small amount of tan. When filming such a set be very careful to light it as if it were in the sun, not in the basement.

Before you make a set like this, go outside and look around, maybe even take pictures for later reference. A set like this can be used to film miniatures or perspective shots. These sets are easy to make and easy to be proud of.

Robby Hamil
Hamilton, OH

Big Movie in Ruins

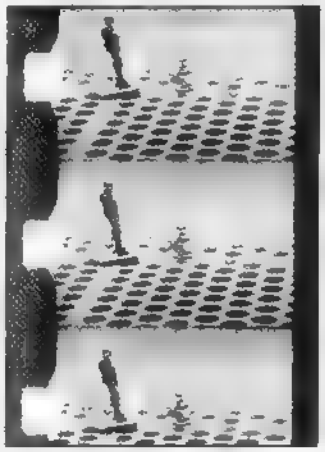
. Recently, I purchased a 16mm camera. Now I am planning to make a *big* movie titled "Ruins." This film will last around 30 minutes. I was wondering if you could tell me if 30-minute films can be entered in the 1980 STARLOG film search.

Mark Szymanowski
Dowagiac, MI

Films to be entered in the 1980 STARLOG film search should be no more than 10 minutes in length.

Filmmakers' Forum

Clay Animation Winners



Steve Husting's award winning animation.

Two friends and I have been doing stop-motion animation for only a year now (SF and fantasy) and have already amassed three awards from contests. We've done all this with absolutely *no* previous experience in moviemaking! The only tie that we have to each other is the fact that we love science-fiction. Our latest nine-minute film, "The Collectors," is currently making the rounds at the U.S. film festival. I, too, would like to see some regular articles about amateur Super-8 filmmakers

Steve Husting
FountainValley, CA

Broken Globe Planets

. To add to your file of amateur special effects, we enclose a photograph we made utilizing a near-planet space backdrop constructed from a hole-punched posterboard and a broken porchlight globe Backlighting, colored tissue paper and paper strips within the globe complete the special-effects effort. The "Eagle" is the easily obtained plastic model and is hanging from black threads.

Don Fox
Nancy Saluva
Saugus, CA

The "Eagle" aproaches a broken globe planet.

Model Misconception

. . Ever since I started making movies I've shied away from models for one reason: making the stand. Sure, I've tried aerial braces, but that takes too much time

In some behind the-scenes photos of how FX are done I've seen some models hooked up to small stands. I have some questions on the stands. 1) When the stand is next to the model, how come it doesn't show on the film? 2) I have a very low budget. Could you tell me a cheap way of making this stand? Could you also tell me a cheap way ($10 to $30) to make a ball and-socket model?

Silvanno Gemmiti
Toronto, Ontario,
Canada

See the article, "Constructing a Wire Animation Model," on next page of this issue. It should answer all your questions. A ball-and socket model is very difficult—try the wire model described in the aforementioned article

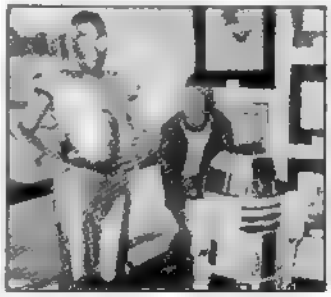
That wasn't a stand you were seeing, it was a calibration device used by animators to measure the movement of animation models. It swings out of the picture before the frame is shot

Jim Danforth animating a creature from the film, *Flesh Gordon*. Note the calibration device to the right of the creature.

Star Wars Remake

. My brother and I are attempting to recreate the *Star Wars* movie We started last year by making a full scale Artoo Detoo. That led to making a C-3PO costume and about 10 miniature spaceships and land vehicles. We have also constructed a five-foot Star Destroyer and a two foot Millennium Falcon

For our Cantina scene we have made Greedo and five other Cantina creatures. There is also a Chewbacca, Stormtrooper and Tusken Raider. All have fu l costumes. Two young friends were the Jawas. We also have the holographic chess game, except that our holograms are made out of clay.

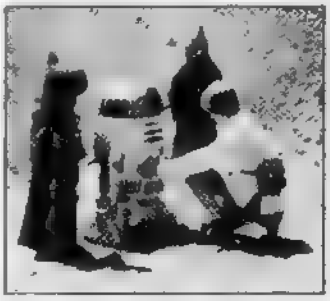


C-3PO and Artoo Detoo.

So far, we have filmed every scene up to when C-3PO and Artoo are brought to Luke Skywalker's garage. We are using the "Story of Star Wars" record and trying to synchronize the sound with the action.

Enclosed are some pictures that we took while we were filming at a nearby sandpit.

Jim & John Jongma
Whitinsville, MA

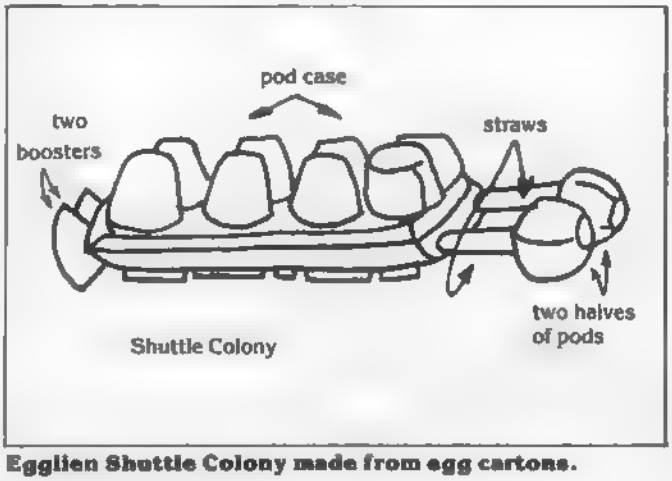


***Star Wars* remake set.**

Egglien Spaceships

I thought I'd write you to tell you of a way to make common styrofoam egg baskets into the most fantastic spaceships you ve ever seen!

I was recently working on a space adventure film with a fantastically low budget and wondered about an inexpensive way to make the ships for it Then, while cracking an egg over breakfast, it occurred to me, The *egg basket*! It's a regular Tinker Toy set of the cosmos! Its parts can be rearranged in a million different ways to construct miniatures'



Egglien Shuttle Colony made from egg cartons.

I've sketched a few of the ways you can arrange them, but you don t necessarily have to use these. You can arrange the different parts several thousand ways to make just about what ever you want

You don t necessarily have to glue model pieces on it for detail, either. I cut and glued little squares to represent windows, conning towers, lasers, etc. just with what I could get from the egg basket itself. You ve got to use Elmer's glue, of course, because model glue eats into syrofoam, but that shouldn't limit you. Heck, I even put lights into some of the ships!

So . . . the next time you get ready to cook the last egg don't throw away the carton. You could be holding the building blocks for another Millennium Falcon'

Cleve Blakemore
Richmond, VA

Use spray paints instead of temperas because the water-base paints won't stick to styrofoam.

Constructing a Wire Animation Model

By DAVID W. RENWICK

Much has been written recently about ball-and-socket armature construction. Building a ball-and-socket animation model is grueling at best. As has been noted in most articles on the subject, the process involves considerable cash outlay, power tools and lots of time and patience.

This article proposes to help the struggling animator: those too young to apply the metal working technology of ball-and-socket armatures, those who don't have the cash or tools to build such refined and expensive armatures, and those who are looking for a quick and simple way to build a workable animation model.

The following is a step-by-step history of a basic wire armature I have used (and refined) since I was 12 years old. It requires only handtools to make and is rugged and easy to animate. It utilizes two twisted wires for body joints, and doweling and scrap wood for body segments. By making a jointed skeleton you avoid the snaky or rubbery look of an all-wire armature.

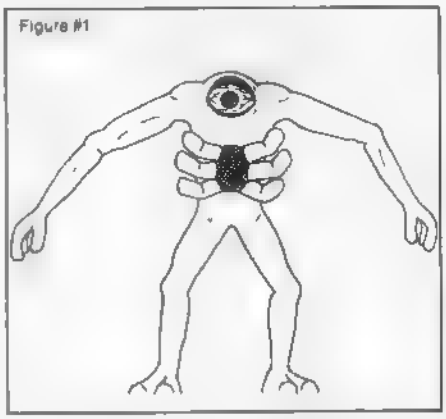
The following list of items can currently be purchased for about $20, and will give you all the tools you'll need *plus* enough materials to build three or four models.

Start by deciding how tall and/or long you want your model to be. The model I built stands five inches tall. Draw your creature's basic shape, actual size, on paper (see figure 1). Plan your armature from this drawing. Draw your doweling segments within your basic creature shape. Allow 1/2" to 5/8" between body segments for wire-and-glue "caps." This will be your guide, or template, for cutting doweling to make body segments (see figure 2).

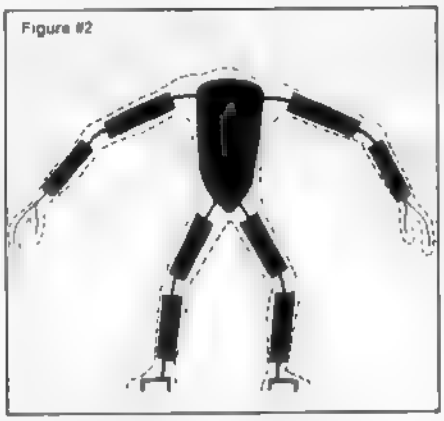
Measure your doweling, then mark it to the desired length. Identify the doweling so you know which body part it is. I use *TA* for "top arm," *BA* for "bottom arm," etc. Use my code or invent your own, but mark each piece

TOOLS
Coping saw
Pliers
Small triangular file
Razor knife or X-ACTO knife
½ inch paint brush
Small scissors
Ruler
Sandpaper

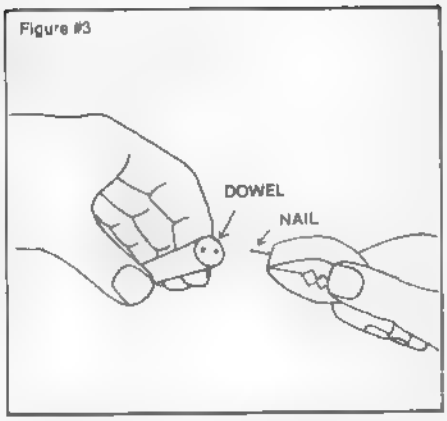
MATERIALS
1—3 ft. x 1/4 inch dowel
1—3 ft. x 5/16 inch dowel
DURO E-POX-E 5 Glue
Wire: (20 gauge) Steel, copper and stovepipe are all good.
Almaloy wire is extremely durable. They'll all work.
Nuts and bolts: (6-32 or 10-24)
Nails: (1/2 inch, 20 gauge)
Foam rubber sheet: (1/8 or 1/4 inch thick)
Liquid latex
Small beads: (for eyes)



The finished wire animation model.



The wire and dowel "skeleton."



Make hole in doweling with nail.

because eight or more short pieces of doweling all begin to look alike. It's better to mark them and save yourself the hassle.

For bodies, heads and other odd-sized pieces, I use scrap 1"x 2" pine lumber. Cut your parts with the coping saw, then use your razor knife and sandpaper to shape them to the desired proportions. A caution: Always cut *away* from your hand (or self) when using any sharp tool. You're trying to build a model, not hack yourself apart, so exercise care and common sense in the use of *all* tools.

The next step is the making of wire joints for your model. You must first make guide holes in the body segments to accept the wire. For this use a 1/2"-20 gauge nail held firmly in a pair of pliers with about 1/4" to 3/8" of the tip exposed. Insert this into all joint areas at two different points (see figure3).

Now cut several three-inch lengths of wire. Using the pliers, insert a piece of wire into each hole as deep as it will go, then give a little extra push so it seats and grips the wood.

Next, twist the wires together. Hold the wood before you. Bend one wire to the right and the other wire to the left and twist the wires together using a circular motion (see figure 4). Twist until you have 1/2" of braided wire, then bend and cut the ends so they'll fit into the next body segment. Assemble the two segments, pushing and snugging the wires into the new segment. Keep making joints in this manner until your model is completely assembled.

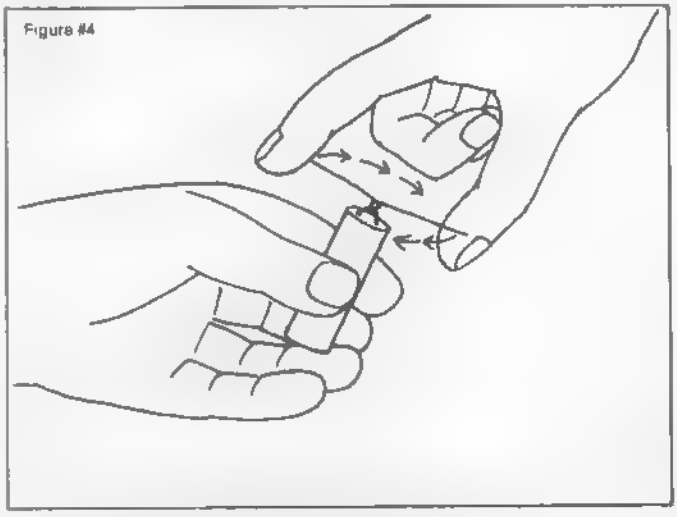
Using E-POX-E 5, glue the wire joints to the wood. You'll have to work fast at this point because this glue sets up quickly! *Don't* try to use the glue once it starts to set up. It will not bond durably once it starts to harden. Use it only while it's as liquid as when you mixed it.

Don't use so much glue that it runs down the braided wires. This will make your joint rigid. My method is to glue all the top joints (looking down on the model); then, after these have dried, I turn the model upside-down and glue the remaining joints. This way no glue will run down the wires. Whatever method you use, apply two or three coats of glue to build up a firm "cap" where wire meets wood (see figure 5). Observe all cautions on the glue packaging and use adequate ventilation (a fan and/or open window) when mixing and using glue.

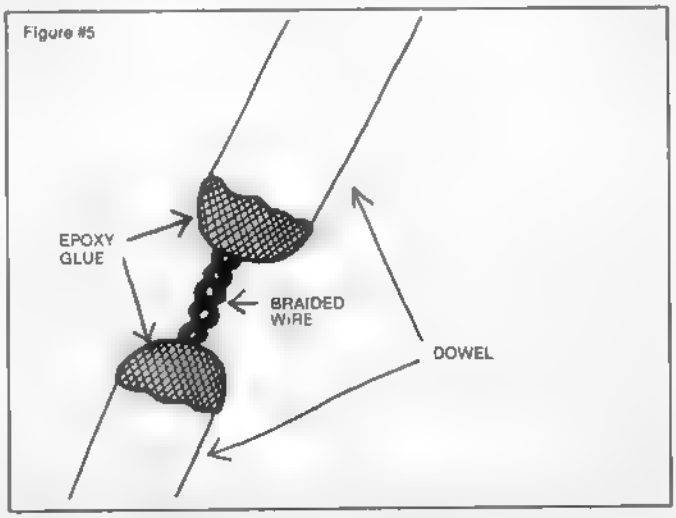
The model's head, if it has one, should be made from scrap lumber and wire. Use marbles or beads for eyes. Cut and shape the head elements as you did the body. Hinge the jaw, or make the jaw with wire. Make "eye holder" loops from wire. Make lips from wire, so your creation can snarl or sneer. Use your nail and pliers to poke holes in the head where eye, lip, jaw and neck wires are to be. Insert and glue the necessary wire pieces to the wooden head. Make a twist/braided wire neck of the proper length and glue it to the body, using the same techniques as before (see figure 6).

One of the best ways to anchor an animation model's feet is to have a threaded hole in the bottom of the feet. Then, by drilling a hole in the set and running a bolt into the threaded foot from beneath, you can rigidly tie down your model. You'll notice my little Cyclops has feet made of tapped aluminum.

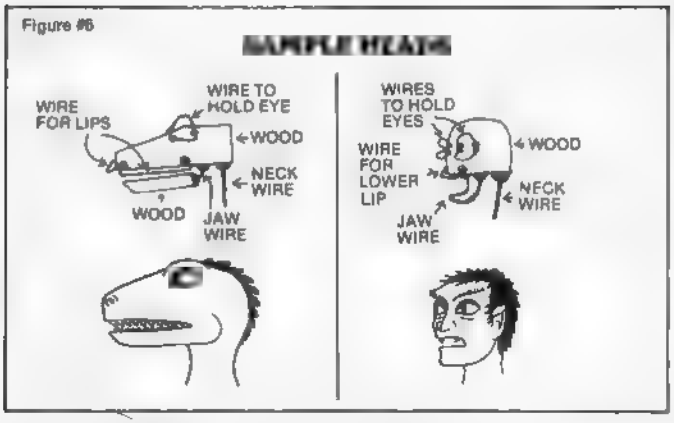
There is another way of making feet that are just as rugged which does *not* require power tools. Start by deciding how large a bolt you want to use to hold your model's feet, and how big you want the feet to be. Use nuts that fit the chosen size bolt to make feet (I use 6-32 and 10-24 at different times). First, using a small triangular file, groove the middle of the outside diameter of the nut. Make this groove deep enough to accept the wire you are using. Loop the wire around this groove and twist/braid it the same way



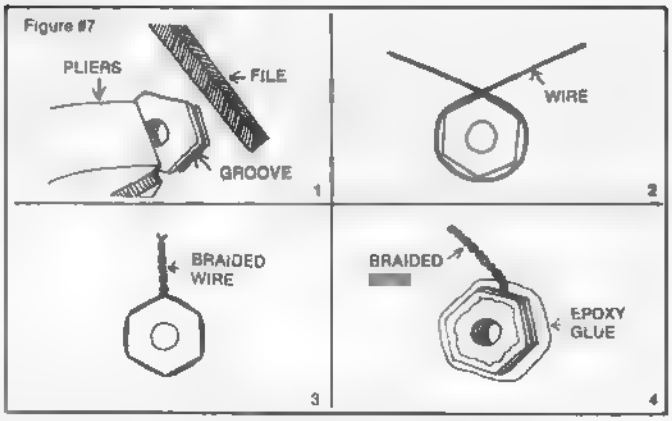
Twist wires together with circular motion.



Build a "cap" of epoxy where wire meets wood.



Latex over wood and wire completes head.



Make the foot support with a standard nut.

as you did for the body joints. As an added strength, use your pliers to give the wire an extra half turn or so at the base (where wire and nut meet) to snug it up to the nut. Bend the braided wire so it stands 90 degrees to the nut. Apply glue to the wire around and in the grooved diameter of the nut. When the glue drys, bolt the nut down to a drilled piece of wood, first putting wax paper between the nut and the wood. Apply glue from top to bottom of the nut's sides. Don't let the glue puddle out away from the nut. Keep working it back around the nut's diameter until it gets tacky and stays there on it's own. When the glue drys, remove the wax paper and file the glue to remove any frilled edge. Attach this foot to your doweling leg, using the same method as for body joints, and you have a completed foot. You can glue wire onto your "nut foot" to make toes, talons or whatever (see figure 7).

Your armature should now be complete from head to toe (see photo A).

I have never tried to foam-cast this type of armature, and I fear the glue would melt if you try it yourself. As easy as this armature is to make, it is equally as easy to add "skin and muscle." This is done by mummifying your armature with foam rubber strips, shaping it and giving it a latex skin.

Start by cutting 1/2" wide strips from 1/8" to 1/4" thick foam rubber sheets Wrap the foam strips around the model as you would apply a gauze bandage. You'll find you will have to wrap three or four times at the joints to get the proper thickness. When you come to the end of a strip, glue it to the last layer with liquid latex. Do this until your whole model is covered with foam rubber (see photo B). You can trim this foam rubber covering to a degree with scissors, just don't cut completely through a layer.

If you want to add muscles, humps or bumps, now is the time. Cut a piece of foam rubber to the shape you wish to add and give its mating surface a coat of latex. Now coat the area you want to add on to with latex. When both are dry, press them together and trim to desired proportions.

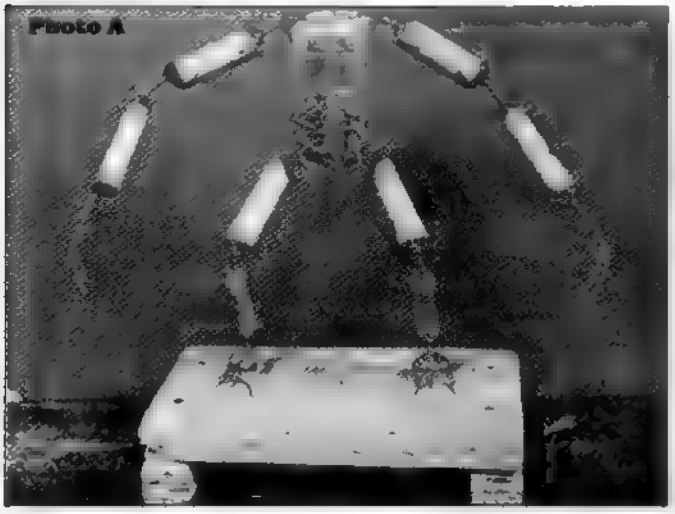
When the whole model is shaped and smoothed to your satisfaction, give its entire foam rubber surface a coat of latex. After the first coat is dry, give the model's surface a last check for smoothness. Trim any irregularities.

Your model is now ready for its final latex skin. Add color to your latex with acrylic paint, or whatever you use to color latex. Three coats of this colored latex will minimize any remaining roughness on your model's bandage and patchwork body and give your creation its final outer skin and color.

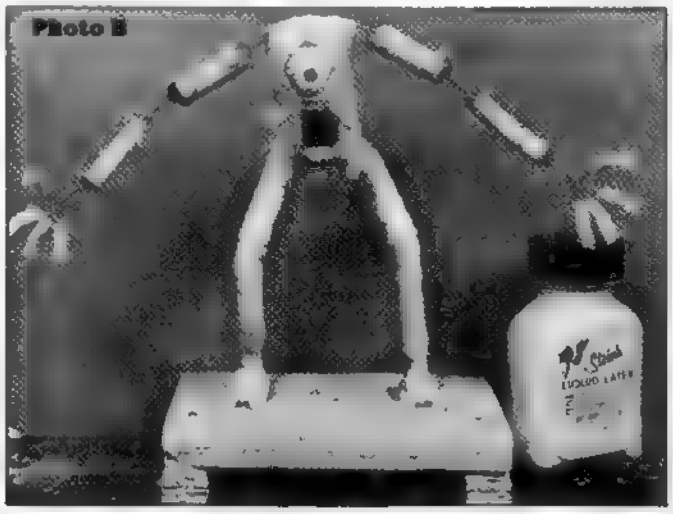
If your model requires hair, now is the time to add it. Wool crepe hair, or even your own, will suffice. Attach it to your model using the same colored latex as was used for the final skin. Before you touch or bend your model, give it a liberal going over from head to toe with baby powder. This will keep the latex skin from sticking to itself. Powder your model about once a month thereafter, or more frequently under extreme use.

This completes your model. You're now ready to animate!!! Keep in mind that your armature is made of wire and will spring back just a bit upon being bent. Compensate for this minor flaw by bending just a bit further than you need to when animating and you'll have no trouble attaining fluid motion on film.

You can vary the rigidity of your model's joints by making them with three, four or more braided wires. This will depend on your model's size and your own personal preference. You can use larger diameter doweling to construct larger and/or bulkier models. You can add warts and ridges to your model's skin with latex. Experiment and enjoy. The possibilities are limitless. Good filming and good future! CM



"Skeleton" stands on nut & bolt support.



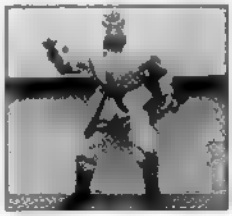
Foam-wrapped "skeleton" gets latex "skin."

Producers' Bulletin Board

Please forward announcements of film projects in current production or near completion to: CINEMAGIC, c/o O'Quinn Studios, Inc. 475 Park Avenue South, New York, NY 10016. Please include a photograph of some phase of the production if possible.

The Rim of the Well. Three humans are flung into a strange dimension known as the well. They are on the well's rim and must escape through the well's heart in order to save humanity or be destroyed in the process. Producer/Director: Larry Hobson. Cast: A race of unusual lizard like creatures, scavenger insects and gleaming robots (actors uncast). Live action. Special effects: animation, miniatures, rear-screen projection and mattes. Super-8, color, sound. Running Time: 25-45 minutes.

Alpha Attack. *Space: 1999*'s Moonbase Alpha gets attacked by a group of aliens called "Sanbantas." Producer: Jeff Booker Sci-Fi Productions. Directors/FX: Jeff Booker & Jeff Trowbridge. FX include: mattes, lasers and explosions. Super-8, color. Running Time: 15 minutes.



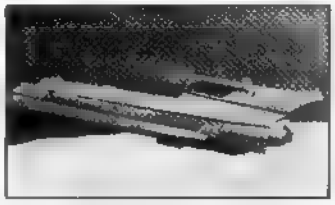
Star Devil. Five star travelers meet horrible deaths on an unknown planet. Producer: R. H. Hampton Productions. Director/FX: R. H. Hampton. Cast: Jill Hampton, Tom & Diane Boisvert, Al & Norine Robbins. Super-8, color. (Robert Hampton, Box 583, Hyannis, Mass. 02601.)

Death in the Cosmos. Earth's first interplanetary mission to Pluto is struck by terror. Producer: Palmer Productions. SFX Directors: Mike Palmer, Rob Palmer. Set Design: Rob Palmer. FX include: miniatures, pyrotechnics, mattes, computer graphics. Regular-8, color. Running Time: 6 minutes. (Rob Palmer, 381 Valanna Crescent, Burlington, Ontario, Canada L7L 2K7.)

Interstellar. Man is sent to investigate alien planet's technology in the starship Prometheus-5. Producer/ Director/FX: Mike King Written by Mike Rottman. Cast: Mike Rottman. FX include: models, double exposures. Super-8, color, sound. Running Time: 10 minutes. (Mike King, 731 Winmar, Westerville, Ohio 43081.)

Guardian of the Thousand Worlds, The. An epic story of unspeakable evil and undefeatable good locked in an age long conflict. Based on the works of H. P. Lovecraft. Producer: David Gardiner. FX: Randy Spencer. Super-8, color, sound. In earliest preproduction. (Istari Productions, Rt. 4, Box 228 D, Harper's Ferry, W. Va. 25425.)

Life at Last. Robots and retarded humanoids are caught up in intergalactic war. Producer/Director: Richard Hallock. Cast: Richard Hallock, Daniel Murphy. Super-8, silent. Running Time: 60 minutes. (Film Classics & Company, 1440 Garryana Dr., Red Bluff, Calif. 96080.)



A Friend Indeed. Based on a short story by Jerry Marshal about intelligent life on Delta Vega VII. Producer: Jerry Conner. FX Director: Jerry Conner. FX include: stop-motion animation of space flight, several spacecraft models. 8mm, color. Scheduled finishing date: Mid-September '79. (Jerry Conner Rt. 5 Box 367-C, Bluefield, W. Va. 24701.)

Nog, the Demon Creature. Hideous creature stalks the African jungle and changes forms to capture his victims. Producer/Director/FX: Steve Kalman Jr. FX include: matte, miniatures, stop-motion animation, aerial brace. Regular-8, color, silent. Running Time: 15-20 minutes. (Steve Kalman Jr., 100 Sr 58, Sullivan, Ohio 44880.)

Ozone. Terror strikes when a hole is made in the Earth's ozone layer. Producer: National Pictures. Director/Writer/FX: Chris Orville. Cast: Brent Hoar, Dorothy Rounds, Scott Anderson, Geoffry Howson, Sharon Guenthner. FX include: special make-up, model animation. Super-8, color, sound. October'79 release. (National Pictures, 6 Ivy Hill Rd., Red Bank, N.J. 07701.)

Gateway into Fear. Young man sets loose the Devil, demons and ghouls through an ancient curse. Producer/FX: Jim Van Bebber. Cast: Jim Van Bebber. Stew Brown. FX include: model animation, split-screen, double-exposure. Regular-8, sound, color. Running Time: 20 minutes. (Jim Van Bebber, 416 Vine St., Greenville, Ohio 54331.)

Renegade. An alien accidentally lands on Earth and seeks aid from a human to help repair his ship. Producers: Daryl Katauskas and Henry Gruba. FX include: launch and hyper space sequences, title animation. Super-8, color, sound. Running Time: 15-20 minutes. (Starship Chicago Filmworks Inc., 308 Warren St., Calumet City, Ill. 60409.)

Power of the Scepter. Conflict of energy resources pits aliens who use solar power against humans who use nuclear power. Producer/Director/FX: Charles Voner. Cast: Norino Mirra, Carol Cuitetelli, Dave McAllister, Charles Voner. FX include: Front projection, mattes, miniature sets and models. 16mm color sound. (CEV Productions, 11 Brown Pl., Woburn, Mass. 01801.)

Starship I. A gigantic starship, the USS Andromeda, is called upon to destroy an invading alien tank-monster. Producer: Michael Moon. Director/FX. Michael Moon. Cast: Bill Coble, Allen Nelson, Scott Nelson, James Robertson, Kyle Cummings and John Tate. FX include: miniatures, aerial braces, mattes, stop-motion animation, rear-screen projections, explosions. Super-8, color, sound. Running Time: 15 minutes. (Michael Moon, 607 Johnson Ave., Graham, N.C. 27253.)

Planet of the Dead. Men vs. mutants six months after a nuclear war. Producer: Chip Galbraith and Tom Giacomini. Director: Tom Giacomini. Writer: Chip Galbraith. (Chip Galbraith, 14427 Blue Skies, Livonia, MI 48154.)

Rampage. Seemingly invincible ape-demon defies destruction and wreaks havoc on the human race. Producer/Director: Mike Hutchison. Cast: Tom Woodruff, Kurt Wease, Tom Hutchison. FX include: stop-motion animation, rear projections, aerial bracing and mattes. Super-8, color, sound. Running Time: 15 minutes. (Mike Hutchison, 1512 Oakes Ave., Williamsport, Pa. 17701.)

Rapid Fire. Cold-blooded killer runs amuck with a machine gun. Producer/Director. Roger Cole. Cast: Doug Norris, Ken Meade, Mike DePippo, Kevin Raponi, Dan Hall, Roger Cole, John DiPippo, Tom Herr, Mark Faella. Super-8, silent. Running Time: 12 minutes. (Roger Cole Productions. 20 New Meadow Rd., Barrington, R.I.)

Red Hand, The. A hand, separated from the body of its owner, encounters many adventures in this sci-fi comedy. Producers: Todd Schwartz and Tim Hays. Super-8, silent. (F&F Productions, 2708 Marigold Dr., Dayton, Ohio 45449.)

Spies in Orbit. American shuttles combat Russian forces in outer space. Producer: H M H. Productions. Director: Ken McConnell. Animation/FX/ Writer: Ed Halbig. Regular-8, color, silent. Running Time: 10-15 minutes. (H.M.H. Productions, 1108 Sheffield Court, Altamonte Springs, Florida 32701)

Space Journey. The crew of the USS Voyager leave the earth in 2213 to find a habitable planet but land back on Earth in 1980 after battling intergalactic pirates and being thrown into a time vortex. Producer: NMW Movie Productions. Director/FX: Scott Nogueira. Cast: (large cast, main characters) Mark Nogueira, Kim Wymer, Jeff Munson, Susan Nogueira, Greg Wymer, Pam Munson. Super-8, color, sound. Running Time: 45-50 minutes. (N.M.W. Productions, 468 Pleasant Ave., Canton, Mass. 02021.)

Space Station 4. (The First Alien Encounter). A commander of a space station meets and battles an alien race. Producer: Star World Pictures. Director/Writer/Miniatures/FX: Don Smith Jr. Graphics: Kyle Ray. Still Photography: Wayne Blaylock. Super-8, color, sound. (Don Smith Jr., 405 N. Front St., Dowagiac, Mich. 49047.)

Shatter Time. The space-time wall that holds the universe together collapses and all matter in existence may be destroyed if a famous scientist fails to stop the resulting cosmic reaction. Producer/Director: Brad Morris. Writers. Brad Morris and Louis Goodman. Cast: Mike Faulkner, Deborah Hughes. Models: Daryl Davis. Super-8. (Brad Morris, 410 Victory Garden Dr., Tallahassee, Fla. 32301.)

Through the Eyes of Ralph. Based on George A. Romero's film, *Martin*. Two boys are out to stop a bloodthirsty psycho who commits a string of senseless murders. Producer: Chris Cronk. Director: Chris Cronk. Written by: Judson Taylor and Chris Cronk. Cast: Chris Cronk, Judson Taylor and Earnest Breig. FX include: sliced arms, intestines and blood pouring from mouths. Super-8, color, silent. Running Time: 15-30 minutes. (Chris Cronk, 1035 Aganier St., San Antonio, Tex. 78212.)

Quest of Alkadia. Earth and her sister planet, Alkadia, are in grave danger of being destroyed by the Alkadians' arch enemies, the Vorkye. The Alkadians send a two-man task force to Earth to destroy the Vorkyes' secret bases there and thwart the Vorkyes hideous plan of destruction. Producer, L.B.M. Productions (Leo Martin & Bill Mitchelson.) Direc tors: Leo Martin & Bill Mitchelson. FX include: miniature models and animated space flights. Regular-8, color, silent with explanatory cassette tape. Running Time· 30 minutes. (L.B.M. Productions, 5622 Gateway Dr., Tampa, 33615)

Space Port. An outer-space whodunnit that takes place aboard an orbital space station. The future of the Earth hangs in the balance. Producer: Apollo Films & KG SFX Enterprises. Director/ Writer: Keith Giglio. FX include: mattes, superimpositions, miniatures, Super-8, color. Running Time: 80-90 minutes. (Keith Giglio, 66 Ladd Ave., Staten Island, N.Y. 10312.)

Star Rider. Starship commander must stop a demon crew member from stealing a planet's treasure and influencing the human race. Producer: L.A S Film Productions. Director/FX: Anthony Smith. Cast: Anthony Smith, Gary Bryant, Eva Cooper and Robert Sam. Super-8, color, sound. Running Time. 20 minutes. (L.A.S. Film Productions, P.O. Box 325, Corbin, Ky. 40701.)

Space Warp. A group of travelers two billion years in the future pass through a space warp on their way to Pluto. Producer: Jeff Booker. Director: Jeff Trowbridge. FX: Jeff Booker and Jeff Trowbridge. FX include: planet miniatures and model of a large alien city. Super-8, color. Running Time: 90 minutes (Jeff Booker Sci Fi Productions, Ltd. 1801 Herefourd Lane, Cary N.C. 27511.)

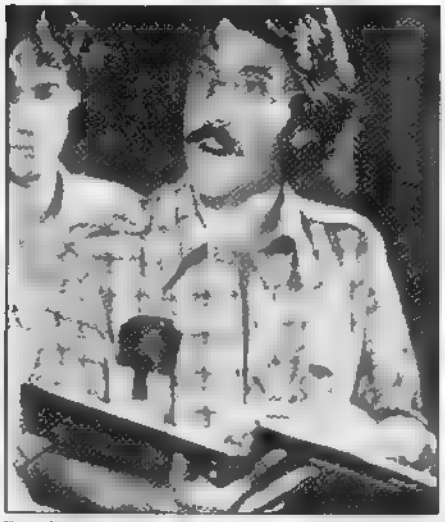
The Visit. A 15-year-old Voo-Doo hougan returns for revenge. Producer: Magic Films. Director/Writer: Edgar Velez. Super-8, color, silent. Running Time: 16 minutes. In Preproduction, release scheduled for '79. (Edgar Velez, 2nd St., #B36, Tintillo Gardens, Guaynabo, P.R. 00657.)

Space Willies, The. An adaptation of the novel of the same title by Eric Frank Russel. The humorous exploits of scout-pilot John Leeming after his forced crash, capture, imprisonment and eventual release on an enemy planet. Producer: M.B.D. Film Productions. Director: M. Brent Done. Cast. M Brent Done, Karl J Brunner, Brad Done and Mark Roza. FX: M Brent Done. FX include: giant starship model and model planets, cockpit set, stop-motion animation, explosions, lasers, costumes and makeup, double exposures and manual tracking. In Production. (M. Brent Done, 5855 Dunbar St., Vancouver, B.C., Canada V6N-1W8.)

Hitting the Big Time

Disney Gives Four Young Filmmakers a Chance to Make Movies

By MISSY SUTTON



David Wechter, 23, (left), and Michael Nankin, 24, (right) co-wrote and co-directed *Midnight Madness*, a college comedy for Disney Productions.

The jocks, debators and sorority girls race around the Bonaventure Hotel in this scene from Walt Disney Productions' *Midnight Madness*.

Just out of film school and with a completed 16mm film *Junior High School* to their credit, four young filmmakers—Helyn Spears (24), Michael Nankin (23), David Wechter (23) and Steve "Jake" Jacobson (24)—were offered a chance of a lifetime to write, produce and direct their own feature films.

"Ron Miller, executive producer of Walt Disney Productions, had seen our movie and called us in for an appointment," explains David Wechter. "He talked about our old neighborhood in Encino and the good old days of Ventura Boulevard for about 20 minutes. I think he liked seeing us squirm. Then out of the blue he said, 'We'll give you a couple of offices, put you on salary for six months and you can do whatever you want.' "

"We had hit the big time! Making real movies is what we really wanted," adds Nankin. "Ron was true to his word. Nobody hassled us. After all, if we didn't come through, we'd be gone in six months."

"Well, we've had our contract renewed for another six months," says Wechter, "and we're starting production on *The All-Night Treasure Hunt* in July.

"The idea of the film came to us on our second day here. I remembered reading a newspaper article about some guy who staged treasure hunts; apparently there are a lot of others that go on around the country, too, so the show could actually happen. We wanted to make it funny but believable. Ron liked it and gave us the go-ahead to develop the idea."

"All this didn't happen overnight," Nankin says. "David and I will be celebrating our 10th anniversary of filmmaking this summer."

"We both drew comic strips of our eighth grade teachers," Wechter recalls. "Pretty soon we were writing stories about them, then we made audio tapes, satires on commercials, Super-8 movies and slide shows. We drove our parents nuts—making them sit through all our great productions. We continued making films, half of which were satires on educational films, throughout high school."

After high school, Nankin and Wechter chose different universities, UCLA and USC respectively. They continued to work on films together, including *Gravity*, which won 30 domestic and international awards.

"In film school you can't make student films until the third year," states Wechter. "We didn't want to wait, so we made two 16mm films, *Girls Who Wear Glasses* and *Gravity*. We were tired of everyone making depressing Viet Nam films, or introspective student films where some guy gets his girlfriend to romp naked in a field of daisies. So we made *Gravity*, a nine-minute spoof on the old science class educational films, with Jiminy Gravity, an animated character showing us how to conserve gravity."

In their third year of film school, Nankin and Wechter met two other students, Helyn Spears and Jake Jacobson, who both had the same ideas about filmmaking.

"Helyn lived on the same street, and our parents were always trying to fix us up. We both ended up at UCLA with the same classes," says Nankin.

"Meanwhile, at USC," continues Wechter, "Jake and I met, were partners for a two-man production team and became good friends.

"The first project we all worked on was *The Comic Strip*. It was Jake's and my student film at USC, but Mike did some animation and Helyn helped out with continuity. Then Mike had a project and Helyn had an animated film, *The Creatures in My Garage*. We all kind of bounced around a lot."

"We got the benefit of both schools," remembers Nankin. "We sat in on each other's classes and checked each other's notes.

"One day, Helyn came up with an idea for a commercial for the L.A. *Times*. She was sick of the ads in the theaters so she drew up a new one on the storyboard. We all got together to

help her out. We rehearsed a presentation and made an appointment with the head of advertising. When we walked into his office we got the head of the classified ads section instead. They thought that we wanted to place an ad.

"But we gave him our presentation anyway. He called the head of publicity and told him, 'I've got some talented kids down here you might like to see!'

"He liked the idea, too, and we got a contract with the L.A. *Times* for $7,000. We finished the film in six months and thought, 'This is the big break!' So we went out on a lot of commercial jobs after that, but we didn't get any."

"We were also trying to get the senior film project at USC," says Wechter.

"We brought in our script on *Junior High School* and had it reviewed by a five-man panel. Out of 25 scripts, only seven could be chosen. We were turned down. They thought the film would cost too much money. But USC's cinema department chairman said, 'If I know you guys, you'll make this film even though you were turned down.'

"It was the best thing that ever happened to us. We decided to make this film an outside project, and our Paradise Pictures became a reality.

"*Junior High School* took two years to make. Mike was still at UCLA, so we used the UCLA facilities.

"We rewrote the show six times, and decided to use color. It ended up costing $25,000. We used the money we got from the *Times* commercial, bank loans, loans from our parents and a $9,000 grant, for post-production, from the American Film Institute.

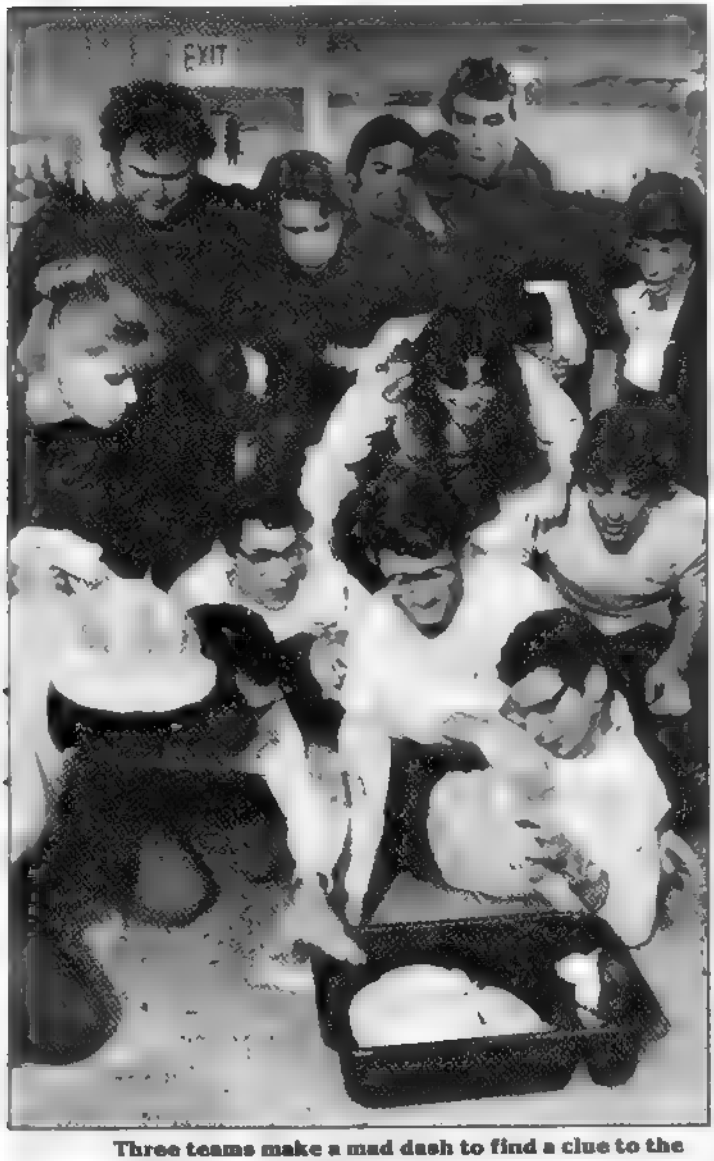
"We just recently finished paying all our debts."

Junior High School won numerous film festival awards and was shown at the Los Angeles International Film Exposition in March 1979. But even before it won any awards, it caught the eye of Don Duckwall, head of Disney's animation talent development program. He really liked the film and brought *Junior High School* to the attention of Irving Ludwig, president of Buena Vista Distribution. Ludwig suggested that the story department take a look at it, which in turn told Ron Miller. Miller was so impressed he hired the four.

"We've always liked Disney films," admits Wechter, "but we are not here to make a typical Disney movie. We hope to expand the company. What we're writing is 90 percent of what we would do if we weren't at Disney. We feel we haven't had to make any compromises."

In addition to *The All-Night Treasure Hunt*, for which Nankin and Wechter are co-writers and co-directors, Jacobson is working on a teleplay, *Leave It to Bloom*, and Spears is working on three teleplays, *Your Bird Is Here, Tom Thompson* and *Rockstar*.

"We've all wanted to make movies ever since we can remember," remarks Wechter, "but we didn't want to go the messenger or network page route that everyone said we had to do. If someone asked us our advice it would be. Go out and make a film of your own. Show what you can do, because anything is still possible in Hollywood, or should I say Burbank?" *CM*



Three teams make a mad dash to find a clue to the "All Nighter" in *Midnight Madness*.

Scott (Michael Fox) plays a video game to find the final clue in *Midnight Madness*.

Sorority gals battle against the "jocks" in Pinball City in *Midnight Madness*.

Review

The Ox Animation Stand

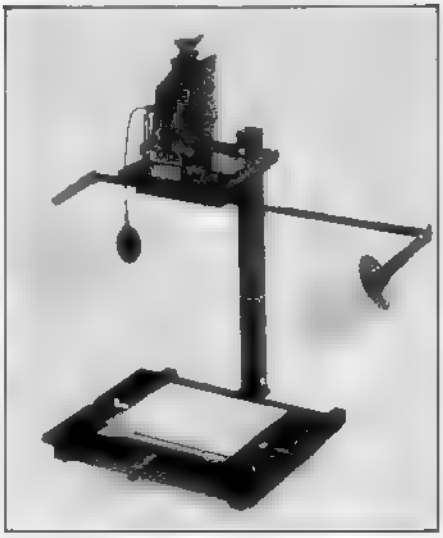
By JAMES F. CALDWELL

Animation often plays a major role in effects-oriented films. However, without the proper equipment, amateur animation attempts are usually shaky and crude.

Unfortunately, most of us aren't as skilled at wood or metal craft as others, so we must limit ourselves to using tripods and other less desirable means for holding our cameras in front of the artwork. Commercial stands have been far too expensive, until now.

The Ox Products Company has finally come up with a good, functional animation stand for under $160! In fact, the construction belies the price—relying on heavy metal in lieu of wood or plastic. I am impressed!

The Ox stand resembles a fancy copy stand. A square column is attached to one side of a flat base. The base is covered in black felt and a groove is cut across it. A cross-shaped piece of metal slides in this groove and the other cross piece fits a groove in the professional-style platen. The platen also has felt on the bottom of it so that it can slide smoothly. It has a pair of upper *and* lower registration pins as well as a glass plate for holding down the artwork. The glass plate swivels out of the way for changing artwork between shots.



The Ox Animation Stand

A small platform which holds the camera in place is bolted to the top of the column. Enough hardware is included for mounting most any Super-8 camera and instructions are enclosed for optically aligning the camera. As sturdy as this stand appears to be, I'm sure that most lightweight 16mm cameras can also be adapted for use on this stand.

Two lights are attached to a rod that passes through the column, just below the camera base. Although small 75-watt spotlights are recommended, I have used regular photofloods with no problems. If you can tolerate color shifts, the small spots are fine.

The versatility of this piece of equipment is best described by detailing a title sequence. For a wipe-on, you can slide (or animate) a piece of black metal in a holder positioned below the camera lens. Or, if a spinning title is more desirable, the camera can be turned 360° and a guide will help you turn it the correct amount for each frame. For an animated title, regular animation cels can be positioned on the pins and animated normally—even a moving background with a recycled foreground (such as a walking figure) is easy to accomplish with this stand.

North, East, West and South movements of the artwork are easy to do, as are diagonal movements. Guides on the base allow you to animate these movements carefully and smoothly.

The Ox Animation Stand is a very cleverly designed and well-built tool for the money. It would be nice to have an up-and-down movement for the camera, but even more expensive stands often don't have this feature. Ox recommends you use the zoom on the camera, which works satisfactorily.

I can definitely recommend this piece of equipment for the neophyte and experienced animator alike.

Remote Controlled Fogger

The new Remote-Controlled Fogger by Rotronics Entertainment Lighting Inc. has many applications for film FX. The Fogger can be used to create a cloud or a mist that hugs the floor for an eerie, other worldly effect. Props or actors can be made to go up in a puff of smoke. The Fogger can be used to achieve spectacular lighting effects with colored lights or lasers. There are many other possibilities.

The Fogger is small and weighs only six pounds and can easily be concealed inside of stage props. It uses fog juice made from inexpensive locally obtainable materials—unlike other devices that require factory-supplied pressurized cans. The Rotronics Remote Controlled Fogger has an oversized one gallon tank, which should last for several months of normal use. A heavy metal shield protects the Fogger from damage as it protects the user from the heating chamber.

To use, one simply plugs it into a standard wall outlet. The control panel includes an electronic heat sensor that informs the operator when the Fogger is up to operating temperature. White smoke emerges from the Fogger whenever the activator button is depressed.

If smoke is passed through crushed dry ice an eerie "hug the floor" effect results.

The Fogger with its remote control panel costs $350, with 50' of control cable priced at $35, and 100' at $60. Additional information may be obtained by contacting Rotronics Entertainment Lighting Inc., 100-CE Rotronics Park, Pembroke, Mass. 02359. If $3 is included to cover shipping costs, the complete 65-page Lighting Handbook will be sent as well.

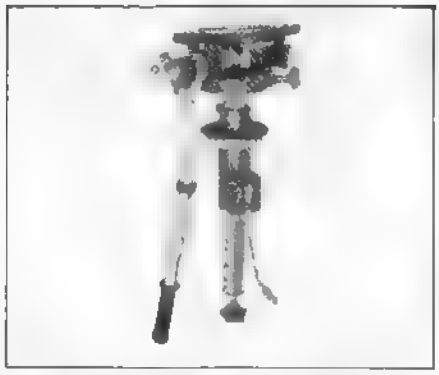
Rotronics' Remote Controlled Fogger

Gitzo Counterbalanced, Panoramic Head

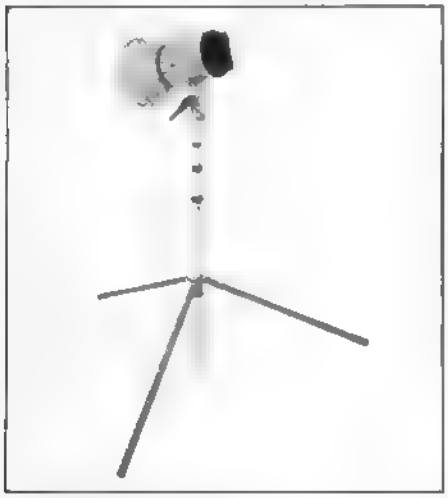
This extra-solid head,for heavy photo, cine and video cameras—up to 65 lbs. and more—is firmly attached to a Rapid or Cremaillere gearlift center column, with adjustable tension to increase or decrease the counterweight

Easily operated by a powerful and extensible handle (range 15"-21"), the head offers 45° front tilt, 45° rear tilt very smooth 360° panning and can be rigidly locked in any position. Its 7" x 6" heavy duty platform has two movable ⅜" (or ¼") solid steel screws, for attaching the camera or an optional quickmount.

The counterbalanced, panoramic head is available with Gitzo Studex, Cremaillere 3, Super Studex, Pro Studex, Tele Studex Tele Industry, 6T and 8T Television tripods. Full five-year warranty.



Gitzo Counterbalanced Tripod Head



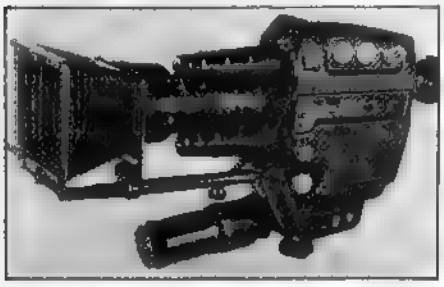
New Gitzo Light Stand

2 New Gitzo Light Stands

World famous for its more than 80 top-precision camera tripods, Gitzo now also offers two extra solid, yet lightweight light stands, in a most desirable combination of rigid center column and smoothly spreading legs.

Made of stress-proof light metal, firmly positioned against the solid center part, the tubular legs with hard rubber tips are spread at an optimal angle of 60°, for maximal stability. The detachable one-inch diameter center column has either two or three friction-free extensions, which glide smoothly and lock firmly—with positive locking rings—on fiber sleeves (no metal on metal)—without any binding.

The EWA-SK8 Kompendium



EWA-SK8 Kompendium Matte Box

The SK8 matte box offered by EWA can greatly enhance the Super-8 filming capabilities of the serious amateur filmmaker. It is specially designed for the Super-8 format and fulfills the demands made of professional matte boxes. The matte box set contains a number of glass slides, faders and masks which enable the filmmaker to achieve a great variety of special effects.

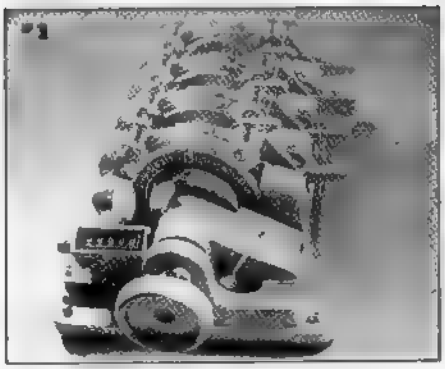
A well-designed attachment system allows the SK8 to be easily fitted to virtually any Super-8/Regular-8 camera and certain 16mm cameras by means of the tripod screw socket. It can be used as a variable-length lens hood for the full range of focal length settings on a zoom lens camera.

The glass slides and masks included in the SK8 matte box set are the basic equipment for the most common special effects. There is also a 5x5cm slot at the rear matte box frame for inserting small gauge slides and filming them in the macro lens setting

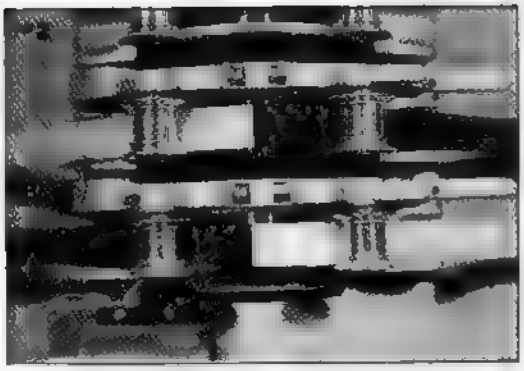
The EWA-SK8 features a "twin" shot matte that enables the filmmaker to show the same actor twice on one piece of film by splitting the screen, backwinding and refilming. There are circle, oval, keyhole, binocular and many other matte shapes. You can cut your own mattes out of black cardboard for special scene requirements.

The EWA matte box Kompendium matte box set is a versatile tool for filmmakers who want to graduate to special effects through the use of mattes. The diversity of mattes that can be achieved with the EWA-SK8 is unlimited to the truly creative filmmaker. CM

The ABC'S of A-B Rolling



Four-gang synchronizer. Numbers on round sprocket counts frames.



Example of A-B Roll. White leader equals original; black = opaque.

By JAMES CALDWELL

A good many amateurs spend waking moments and sleepless nights pondering over the problem of obtaining invisible splices on the big screen. There is a constant search and ultimate abandonment of splicer after splicer in a frustrated attempt to achieve the perfect (invisible!) splice. Well, while searching (if you are one of these harried filmmakers), you may wish to try an alternative: A-B rolling

A mysterious aura surrounds this term, also called checkerboard printing, but don't be frightened. The concept and execution are really not that difficult. A certain amount of equipment is needed, but the purchase of these essentials may prove to be cheaper than buying splicer after splicer and the results will dazzle you!

Basically, A-B rolling is simply breaking down the original film into two rolls. The scenes are alternated back and forth: the odd-numbered scenes on one roll, and the even-numbered scenes on the other. In other words, scene one goes on Roll A and scene two goes on Roll B. In between each scene, opaque leader is spliced that runs parallel and is the same frame length as the adjoining scene on the opposite Roll. Quite simply, if scene one is on Roll A, then an equal amount of opaque leader is spliced into Roll B. Next, shot two goes on the end of the opaque leader on Roll B and an equal amount of leader is spliced into Roll A. Sound confusing? Well, study illustration #1 and I think it should clear things up.

There are many terms such as "opaque leader" which will be mentioned in this article. Therefore, I'll put in a glossary at the end of this article to refer to. If you see a term that you don't understand, turn to the glossary.

If you are ready to roll up your sleeves and give it a go, there are a few pieces of equipment that you will need. The most important is a synchronizer. A synchronizer is a mechanical device for holding lengths of film in frame-for-frame sync. You will also need a good pair of rewinds, a good cement splicer, a good tape splicer (yes, one of each!), plenty of opaque leader, and lots of patience! Overexposed leader or film from your movies will *not* work as opaque leader. They are not opaque enough. Opaque leader as well as incidental items such as grease pencils and cement can be purchased from film labs.

For the cement splicer, I recommend the Hahnel Collmatic or Bolex splicers. Cement is essential for the original film since tape splices would cover part of the frame and defeat the whole purpose of A-B rolling, which is to achieve an invisible splice. On a cement splicer, an overlap splice is made. In A-B rolling, the overlap is always made with the picture over the opaque (see illustration #2). When Roll A is contact printed by the lab, the opaque leaves unexposed sections which are filled in perfectly by the scenes in Roll B.

Let's take a film step by step through the entire process. For illustration sake, I have used pictures of 16mm since it is easier to see. However, the same technique applies to all formats.

First of all, have your film workprinted and edge numbered. Although you can edit your original into A-B rolls without the workprint, it is more difficult. If sync footage on full-coat is involved, it is *very* difficult. I know; I've had to do it.

Next, edit the workprint just as you would any film and use tape splices. Any tape splice will do. Tape splices can be pulled apart should you change your mind, and you won't lose any frames. Leave at least two frames at the ends of all scenes to allow for splicing the original later on. If your original scene was shot 24 frames long and you want to use the whole shot, cut off two frames on each end, leaving 20 frames. Since you lose a frame when you ultimately cement splice the original, you need to leave a safety margin. Actually, you only need to leave one frame, but leave two for safety sake.

After your entire film is edited it is time to conform the original film. You can send your original and workprint to the lab for conforming, but this article is for those wishing to do it themselves.

The edge numbers on the workprint should be lined up in the synchronizer with the original and the original film cut (with those extra frames for splicing!), and arranged in the order they will appear in the final film. Any method used to maintain order can be used. (I use the potato chip racks used in convenience stores. Turned on their sides, they make perfect film holders. They can also be obtained from potato chip distribution companies.)

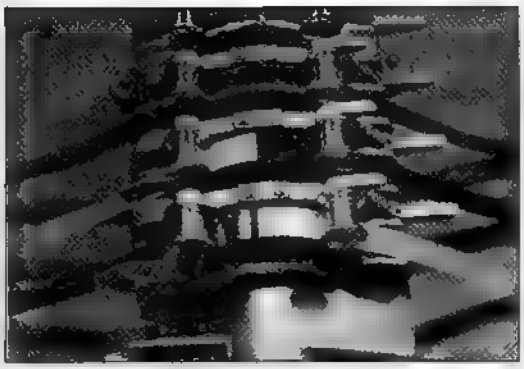
When your entire original has been cut, you can start A-B rolling. Put at least three feet of leader in the first two gangs of the synchronizer. The edited workprint leader goes in the third—assuming you are using a three or four gang synchronizer. If you are only using a two gang, the rolls must be edited one at a time; first Roll A, and then Roll B.

On all the leaders, punch a hole in a common frame. These must all be lined up as zero feet, zero frames on the footage counter and marked on a log as such. The log will be used by the lab to add any fades, dissolves or supers that you may desire—an added feature of A-B rolling!

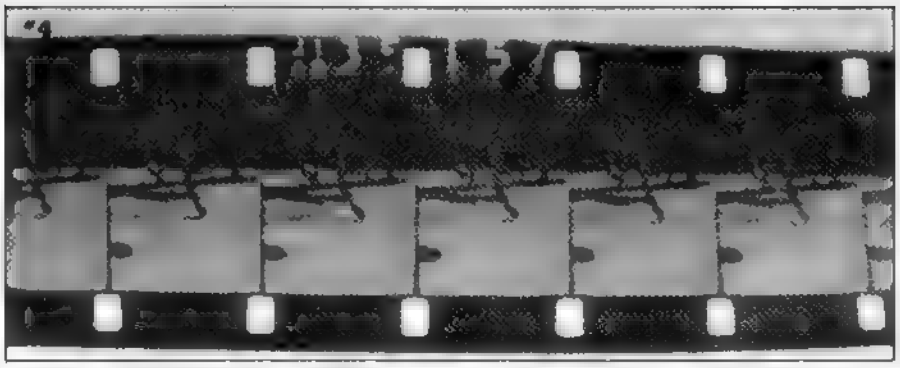
Advance the synchronizer two feet and at the two foot, zero frame point, mark and punch the leaders. Mark these on the log as check frames.

Something to keep in mind is that there are 72 frames per Super-8 foot. For 16mm, there are 40 frames. That is why synchronizers are usually marked in feet and frames. The labs also use this same reference.

After advancing the leaders another two feet, you can cut in your first scene. Line up the first frame of the workprint with this point and make a mark on the roll nearest you, which will be Roll A. Pull the first scene off of the rack and splice the first frame of scene one onto this point. Remember to scrape the emulsion *only* on the picture roll and overlap it on the opaque. Next, mark the last frame of the original on Roll B (after you have



Set-up for conforming. Film at rear of photo is edited workprint.



The edge number on 16mm film is essential for matching up and conforming the original and the work print. Numbers are every 20 frames.

passed both rolls through the synchronizer) and double check that it matches the workprint. Splice scene two at this point onto Roll B. Continue this way for the balance of the film, back and forth between Roll A and B.

If "Academy" leader is used, it should be spliced as scene one onto Roll A. Academy leader should also have been spliced onto the workprint and should be matched up frame for frame. After the "2," 48 blank frames should be left before splicing in the first scene of the movie on Roll B

If you have followed instructions to this point, you should go along quickly. Remember, each original shot has two extra frames on each end!

Should you desire a fade-in or a fade-out at a specific point, log the foot and frame number of the first frame of the fade. Be aware, however, that some labs only have fixed fade rates, such as 48 frames. That means you can only do a 48 frame fade. So, count 48 frames past the frame you marked on the log and log this frame number as the end of the fade. When the printer comes to the first frame you marked, he will cause the printing machine to increase or reduce the printing light to execute a fade-out or fade-in.

For a dissolve, it gets a bit more complicated. First of all, you need to leave enough frames on the original when you cut the workprint. In other words, suppose you want a 48 frame dissolve (remember, some labs will only do a fade of this length, and a dissolve is merely a fade-in superimposed over a fade-out). When you cut the original, leave at least 52 frames before the very end or beginning of the scene (this includes the two-frame safety margin!). On the workprint, cut 24 frames from each shot and tape it together. This splice represents the middle of the dissolve. Make the appropriate conforming marks on the workprint.

When you are cutting the original, the entire 48 frames are spliced into the A and B rolls. The only difference from a regular cut is that they are overlapped so that for the entire 48 frames they run parallel. Mark the log as in the illustration and you are all set.

A superimposition is done the same way. The title (or whatever) is cut parallel with the opposite roll and the fade or proper information is marked on the log sheet. If you are doing a title, it must be shot with white letters on black—preferably from a Kodalith negative. I am preparing a future article about making and using Kodalith negatives for titles. In the meantime, refer to Volume 1, #2 of CINEMAGIC.

Once you have finished conforming the entire original, run it back to the beginning and carefully check each splice. The splices should be strong and no cement should creep into the picture area. Double check that there are no overlapping frames or gaps between the two rolls. Should a gap occur, there will be a black frame between two shots in the finished print. If you have overlapping frames, there will be a double exposure in the final print. If these occur on just one frame, chances are that it won't be noticed. However, there is little excuse for this to happen. Just be careful and double check each splice.

As mentioned earlier, you can set up A-B rolls without resorting to a workprint. You must be very careful when editing the original and be sure to use tape splices! When you are done editing, simply pull your shots off the roll one at a time and splice them into the two rolls as described above. Dissolves must be left in the original edit with the full amount of frames of the shots end to end. Thus, if you are running sync full-coat with your film, you must adjust for the extra frames.

The only thing left to do is to send the A and B rolls to the lab for printing. When you get the film back, you can sit back and dazzle your filmmaking friends. No splices! No jumping in the projector gate! Dissolves and professional titles over live action! Although it won't make up for a bad movie, you can now abandon your search for the "perfect" splicer by using A-B rolling! CM

GLOSSARY

A-B Rolling. Special preparation of original film for copying with no splices evident in the final print. Also, effects such as fades, dissolves and supers can be easily added. Additional (C, D, etc.) rolls can be added, although these are very unusual.

Academy leader. Special leader designed by the Academy of Motion Picture Arts and Sciences. This leader contains synchronizing information and cue marks. Similar to SMPTE leader.

Check frame. A frame punched into all leaders of the A-B rolls to make sure that they are all in sync.

Conforming. The matching of the original film to the edited workprint.

Dissolves. Fade-in superimposed over a fade-out. The two scenes melt together.

Edge numbers. Numbers printed in common on the workprint and original to match up frames during conforming. Professional 16mm stock has these latently printed on the edge which are developed with the picture.

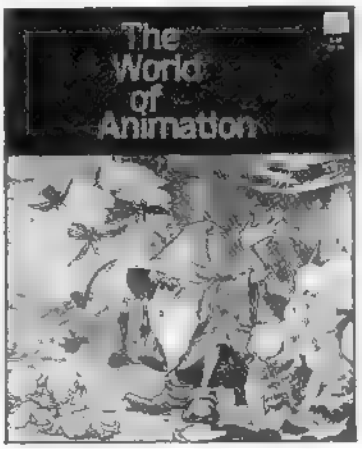
Opaque leader. Special leader which has been exposed and developed to its maximum density. It is used in A-B printing to prevent the printer light from exposing certain sections of the print film.

SMPTE leader. Used in television (in place of Academy leader). Gives timing cues in seconds. Last frame is a "2" which is followed by blank footage before the picture starts.

Supers. Short for superimpositions. An example is a title appearing over a live background.

Workprint. A copy of the original film which is used for editing purposes.

Books



The World of Animation
By Raul da Silva. Kodak, Rochester, N.Y. 8½"x11". 152 pages.

Kodak has done it again with *The World of Animation*. The book is a definitive text for anyone who desires to learn the techniques involved in making animated films. Kodak's publications have long been the standard reference books for the film industry. *The World of Animation* is no exception to this long established trend.

The book is profusely illustrated with cels from famous cartoons, step-by-step illustrations of animation techniques and instructional photographs. There are also photos of famous animators.

The book opens with a brief history of animation: how it got started and how it reached its current level of commercial popularity. There are many fascinating vignettes about the early days of animation and how the most successful animators got started.

The book explains the basic techniques of animation as well as synching sound to animated films. Storyboarding and its significance to a polished production are discussed. The different styles of animation (photographic, dimensional, slide, computer and cel) are described and explained.

The animation stand as the most important tool of the animator aside from the camera is fully explained. There is even a complete set of blueprints for building your own animation stand for about $230 ($410 with the optional Oxberry disc). The blue-prints alone are easily worth the price of the book.

Budgeting, an aspect that is extremely important to the amateur animator, is discussed and many helpful hints are given.

The different production personnel who are needed for a major production are named and their job duties are described. This section of the book can give an aspiring animator a good idea of what kinds of jobs are available in the field.

The different types of film to use for animation and their specific applications are fully explained.

There is a glossary of technical terms that the serious animator will need to know. There is also a list of sources for obtaining necessary equipment and materials.

The book even tells the aspiring animator how to go about getting work with a producer.

The World of Animation is an attractively packaged storehouse of information that's not only an indispensable reference book, it's also fun to read.

Contests, Festivals and Grants.
Compiled by Alan Gadney. Festival Publications, 5½"x8½", 610 pages. $15.95 softbound, $21.95 hardbound.

This new reference directory is designed for everyone in films, video, audio, photography, TV-radio broadcasting, all types of writing, poetry, script & playwriting, publishing, advertising, print & broadcast journalism.

It lists complete, accurate, up-to-date and easy-to-use information on millions of dollars in worldwide contests, festivals, competitions, grants, money and equipment loans—prizes, awards, honors, project funds, etc. There are 1,888 separate events listed.

Each event listing includes current addresses, dates and deadlines, complete entry requirements—eligibility and fee information—awards available and how they are judged, etc. There is a 47-page Alphabetical Index which lists each event, sponsor and award—a Subject/Category Index for quick access to 323 special-interest areas—helpful hints on how to win, etc.

Contests, Festivals and Grants was compiled by Los Angeles writer-filmmaker, Alan Gadney and is available with a 14-day complete money-back guarantee from Festival Publications, Dept. PR, P.O. Box 10108, Glendale, California 91209. Add $1.75 for postage and handling (and 6% sales tax for California residents).

Electronic Special Effects

Part 2

Sequential Lights: From Airport Runways to Flying Saucers

By KENNETH WALKER

In the last issue of CINEMAGIC, I detailed a rather easily built, straightforward light flasher circuit for creating your own computer panel lights and other special-effect projects, using modern electronic ICs (integrated circuits).

With any luck—and some patience—you have now completed this original circuit (learning something about electronics in the process); found the circuit's advantages over similar mechanical devices; discovered several *dis*advantages to its rather "one-dimensional" operation and are probably wondering how to modify this basic light flasher to operate in other, possibly more entertaining ways.

One such modification, easily accomplished, is to replace a particular IC in the circuit with one that performs a slightly different function—to *sequentially* flash a string of lights, one bulb at a time. This is the perfect project for adding life to a model airport runway, or for installing "landing bay" lights in your *Battlestar Galactica* model, or simply for general "instrumentation" use in your spaceship bridge set.

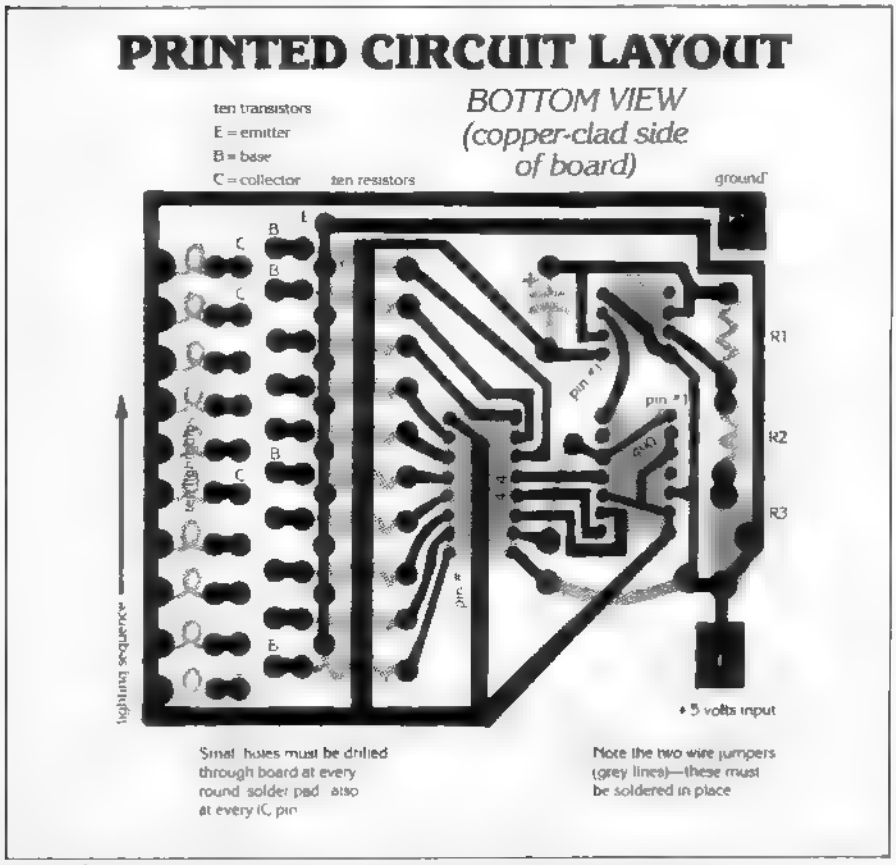
The new IC you'll be using, the 74145 (or 7445), is an inexpensive electronic "package" that performs its specialized function very well (and very inexpensively, for about $1.19 at Radio Shack). The proper, tongue-twisting name for this device is a "BCD-to-decimal decoder/ driver." For our purposes, though, what it essentially does is change a *digital signal*—as from a 7490 IC—into 10 distinct, sequentially activated outputs. These can be used to flash lights and other things. (If you'll recall, the similar IC in last issue's project—the 7447—had only *seven* outputs, and these were not sequential.)

BCD is simply digital talk for the way electrical signals are counted and processed in a computer—which is itself composed of nothing but digital circuits and ICs. So, as a bonus with the building of your light flasher circuit, comes an introduction to the fundamentals of computing!

As with last issue's installment, I prefer not to do the usual step-by-step, "solder wire A to pin B" construction article. I've found that this approach is a sure-fire way to turn off most newcomers to do-it-yourself electronics articles. Instead, I'll let the wiring layout speak for itself. Follow the diagram closely, and your circuit should be up and running in an afternoon, awaiting the spark of life (in this case, +5 volts.)

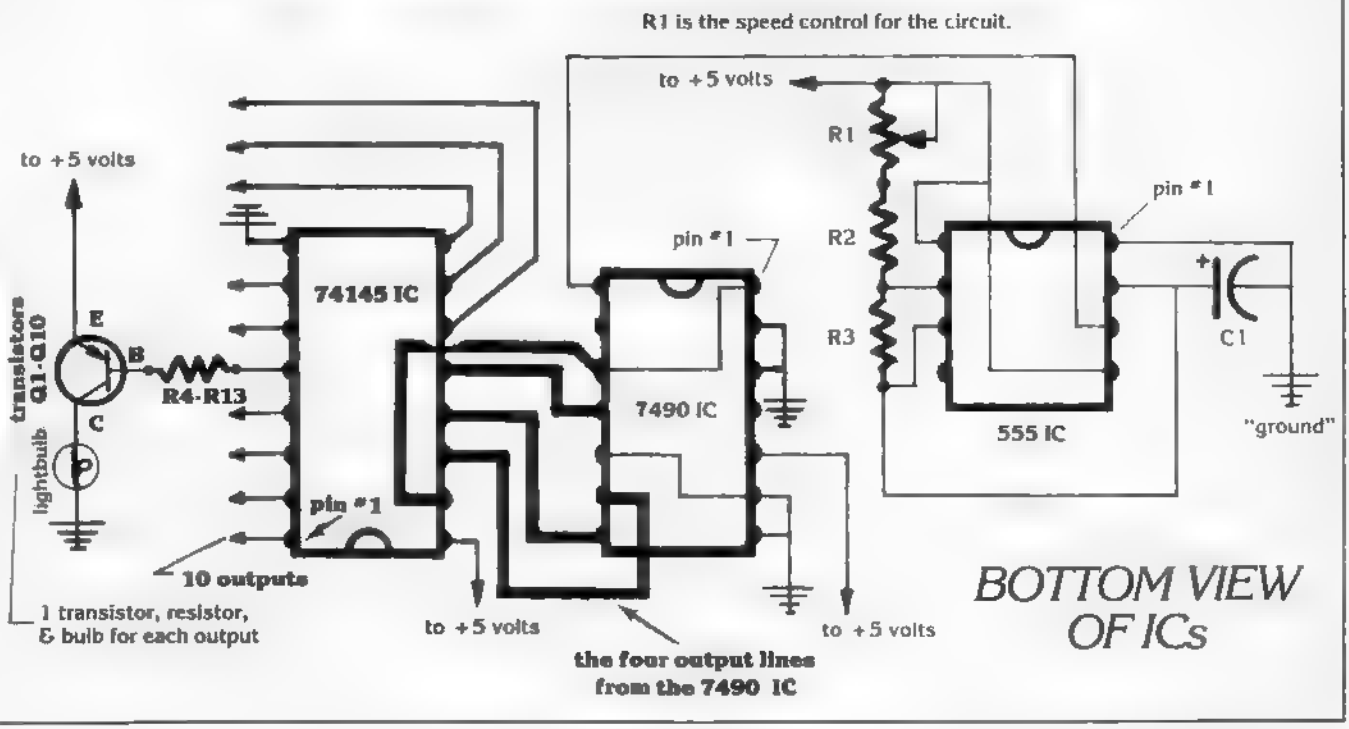
If you are new to this series on **Electronic Special Effects,** the modified circuit layout given here will be all you'll need to get the new project operating. But if you followed last issue's instructions and have already built the original circuit, the modification described here involves a small amount of rewiring. Since the 74145 IC has 10 separate outputs, you will now be needing *10* resistors, transistors and lightbulbs to make the circuit operate at its best. (See the "key" for the proper parts values.)

For those readers who built last issue's seven-light flasher on a printed circuit board, a *new* board able to accommodate the three added groups of resistors, transistors and bulbs should be made (taking into account the four different connections between the 7490 IC and the new 74145 IC). Although the necessary wiring modifications can be made to your existing circuit board—by jumping wires to and from various spots— the safest and surest method of getting the new project to work is to build an en-



Use this schematic of my Sequential Light Circuit to build your own.

TEN-LIGHT SEQUENCER CIRCUIT



KEY

1K = 1000 ohms resistance

PARTS LIST

R1 = 500K potentiometer
R2, R3 = 10K resistors, ¼ watt
R4-R13 = 1K resistors, ¼ watt
C1 = 2.2 microfarad electrolytic capacitor
Q1-Q10= 2N 5139, or 2N 3906, or similar P-N-P transistors
Small lightbulbs = 1.5 volt, 15 milliamp (Radio Shack #272-1139) or #48 bulb (Sylvania, General Electric, etc.)

tirely new board for it. And if you chose to IC *sockets* in your first circuit, you can now easily trade ICs back and forth between the two light flasher projects, though why you would want to is beyond me. ICs are so inexpensive you can afford to have several sets lying around.

It would be wise, though, to install the resistor/transistor/bulb combinations on a *separate* circuit board, which can be hooked up to either light flasher circuit. The lightbulbs and transistors are by far the most expensive components you'll be using; making one "lightbulb board" do double-duty can save you some money. Besides, having the lights on a separate card makes them that much easier to install in tight spaces in your projects.

If all of this rewiring has set your mind reeling, don't despair—a completely layed-out circuit board template for the new 10-light sequencer accompanies this article.

As I've said before, integrated circuit projects should be wired on circuit boards if at all possible; if only to keep a tangle of wires out of your way. But if the thought of actually having to create one of these things (or of spending money to buy one) has you running for the nearest closet to hide, take heart—the special circuit board building instructions included with this article will guide you step-by-step in making your own high-quality boards.

ICs are hearty beasts and can take a lot of abuse, but they *can* be destroyed if the five-volt power supply voltage makes contact with incorrect pins. Happily, ICs are cheap—if you destroy several it will not break the bank to replace them.

The nice thing about digital circuits in general is that even a person who is "all thumbs" can still manage to create a working device—provided the wiring scheme has been followed exactly. If you're still uneasy about wiring the circuit, a ready-to-use circuit board is available (see the end of this article).

Remember to use IC *sockets* if you go the route of making your own circuit boards; high soldering temperatures may harm electronic components otherwise. A final tip is to use *only* "rosin core" electronic solder in your circuit-building work; it's specially made for this purpose, and is just as easy to get as any other kind of solder.

Once your new 10-light sequencer is up and operating, it is a simple matter to hook up several identical circuits to operate simultaneously. (The same four *outputs* from the 7490 IC can be wired to four or five separate 74145 ICs.)

It is really this *multiple* use of the basic circuit that makes sequencing lights so visually interesting. Once you see the lightshow in operation, it will practically yell out dozens of suggested uses. Airport runway lights, for example, can be made by placing two strings of sequencing bulbs next to each other, the lights proceeding in the same direction. (And remember that the "speed control"—RI—can be turned to slow down or speed up the action.) Take a look at the flying saucers in both the film *Forbidden Planet* and the TV show *Lost in Space* of several years back: both saucers had "circulating lights" inside their bottom domes, an effect easily accomplished with electronically sequenced lights placed behind squares of frosted plastic. Even fantasy *costumes* can be embellished with a few well-placed bulbs.

For a really novel effect, try using the circuit—without lightbulbs but with the now-open wires going to a fuse of some sort—to electronically detonate a line of flash powder charges similar to a fighter plane's machine-gun strafing of enemy soldiers on the ground. A little experimentation with *nichrome wire* and your favorite flash powder could open up even more potential special effects uses for the circuit.

Next issue, CINEMAGIC begins an excursion into the modern world of computer-controlled special effects and devices (remember the Dykstraflex?). I'll be delving into some of the state-of-the-art technology responsible for such effects masterpieces as *Star Wars* and *Battlestar Galactica*, as well as presenting some techniques that *you* can use to create extraordinary imagery for your own SF film epics: streaking, slit-scannng, time-exposure cinematography and more. I'll also explain the mechanical magic of *stepping motors* and what makes them—literally— tick. With a little enterprising ingenuity (the stuff Hollywood effects pros are made of) you may just be able to put together your own camera tracking system! See you next issue.

In the interests of safety, and to give the reader more time to become familiar and comfortable with possibly new-found electronics knowledge, the modification of this circuit to power 120-volt household lightbulbs and other "high-voltage" devices has been put off until a future article. Such projects really shouldn't be attempted until one is thoroughly grounded (no pun intended) in the fundamentals of electricity, and then work should proceed only with caution and with respect for the dangers inherent in basic electrical work.

(A ready-to-use, etched and drilled circuit board for this issue's project—minus the parts—is available for $5.50 from KENNETH WALKER, c/o CINEMAGIC, O'Quinn Studios, 475 Park Ave. South, New York, New York 10016.) CM

Creating Your Own Printed Circuit Boards

There are only 3 things you'll need to make your own boards: a blank copper-clad board (clad on one side only), a "resist pen" and some liquid "etchant." All three are available from Radio Shack. Assuming you have drawn out, on a piece of paper and to full scale, the entire wiring scheme of your circuit—an essential step, which must take into account exactly where the different ICs and other parts are going and how they will interconnect with each other. Make sure that there are no drawn wires *crossing over* one another—you are now ready to make the actual board.

Start by copying your drawing as accurately as possible onto the *copper* side with the resist pen. What you are doing here is actually *drawing* the electrical conductors onto the board. The Conductors take the place of actual wiring. (It's a good idea to scrub the original blank copper board with Ajax or Comet cleanser, before drawing your circuit layout on it.) When making your resist ink drawing, note that any copper NOT covered with black resist ink will be dissolved and removed in the next step, which will be to submerse the board into a shallow *plastic* container of copper etchant. Leaving the board covered with this chemical, while agitating the container, will produce a professional-looking printed circuit in from 15-20 minutes, with the thin copper conductors going just where you designed them to go.

The final step is to drill tiny holes into the board to accommodate the various electronic parts. When making your original drawing of the wiring layout on paper, remember that you are visualizing things from the *bottom* of the electronic components—during soldering, the parts will be inserted through the top (non-copper) side, with their leads pushing through to the copper-clad side of the board. Your printed circuit is now ready for soldering.

A much less expensive substitute for "resist ink" in making your circuit boards is Rapid-O-Ink *For Film*. Use a small artist's brush or technical fountain pen—like the Rapid-O-Graph—to draw your circuit onto the copper. This ink will actually do a better job of coating the board than regular resist ink. It's essentially a coating of *plastic*, which seals the copper underneath it from the etchant.

CORRECTION

In last issue's "7-light flasher" circuit, a necessary circuit connection was erroneously deleted. In order for the 7-light flasher to operate properly, a small wire should be soldered between *ground* (negative side of the power supply) and the two grouped pins (pins 2 and 3) of the 7490 IC. Also, the circuit is layed out as viewed from the *bottom* of the ICs. We regret these errors.

Note that the "10-light sequencer" circuit and circuit board layout in *this* issue already contains this correction, and will work perfectly "as-is."

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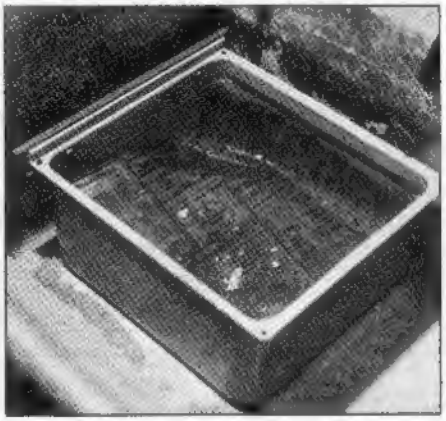
Close-Up

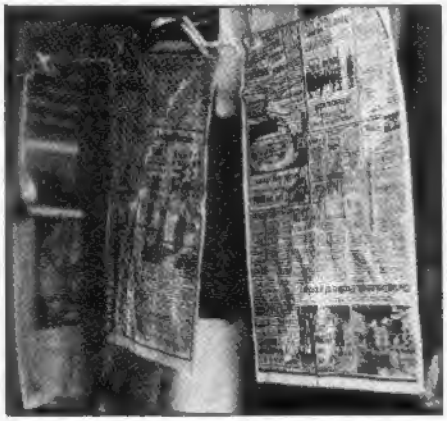
Easy Smoke and Fog FX for Your Films

Ample clouds of billowing white smoke can be easily and cheaply produced with some old newspapers and potassium nitrate

By DON DOHLER



First dissolve 10 ounces of potassium nitrate in one gallon of water. This should be done in a large rectangular tray. Sheets of newspaper are placed in the solution until soaked.



The soaked newspapers are hung on a line to dry. When dry, prepared newspapers should be stored in a cool, dry place, since you are dealing with a flammable substance.

When dry, the prepared newspapers can be rolled into tubes, as David Donoho the creator of this method, is doing. The tubes burn longer and less intensely than crumpled papers.

When ignited, the newspaper will burn violently and give off huge clouds of smoke. Helpers can lay down a trail of smoke on an outdoor, nighttime setting. Drop the papers as they burn down to the end.

PHOTO: RICHARD GEHNITZ

Wind direction, the number of smoke papers used and the size of an area to be filled with "fog" all have an effect on the density of the smoke. The smoke is effective against headlights at night.

Newspapers were arranged in the form of a man who had been hit by a "ray gun." The camera starts a bit after the papers are ignited. The effect creates the final smoking smoldering aftermath of a human disintegration. A more concentrated solution of potassium nitrate is required for this effect.

Although potassium nitrate smoke papers will have you and your aids smelling like smoke after a night's shoot, the chemical is safe to humans and nature as well—the black ash residue left by the burned paper will not harm the grass and can easily be washed off of sidewalks. Potassium nitrate is sold by local chemical companies. Cost is approximately $40 per 100-lb. bag, which should be good for a thousand sheets of newspaper.

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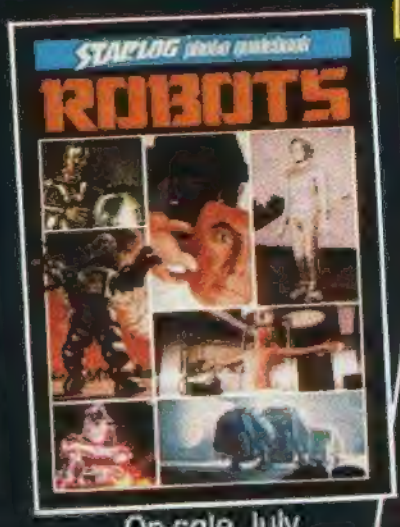

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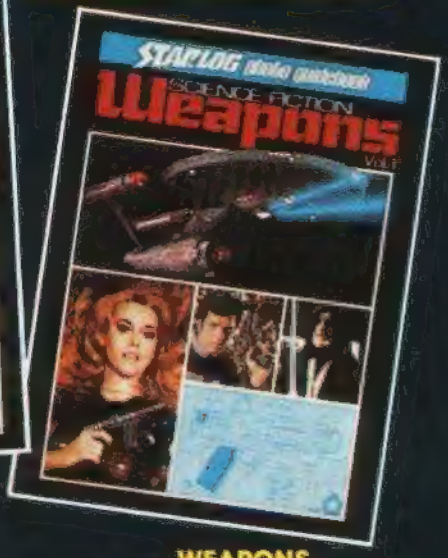

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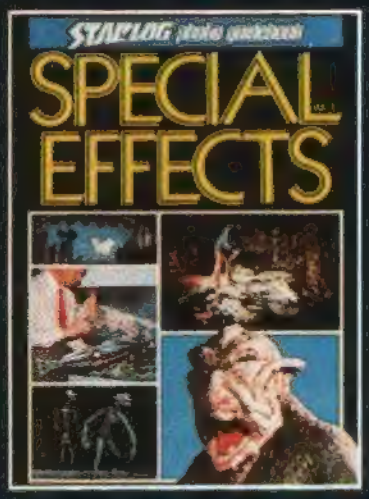

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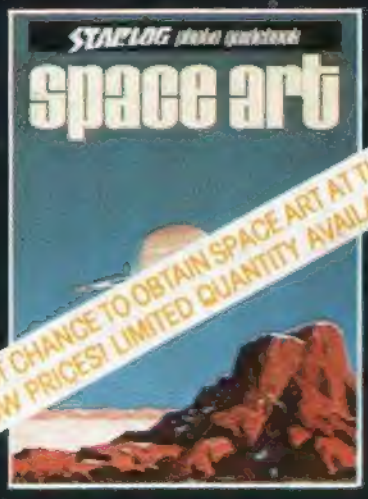

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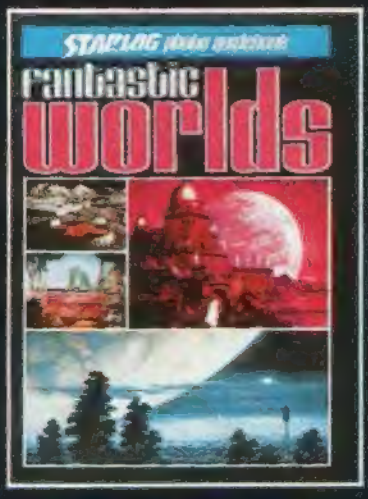

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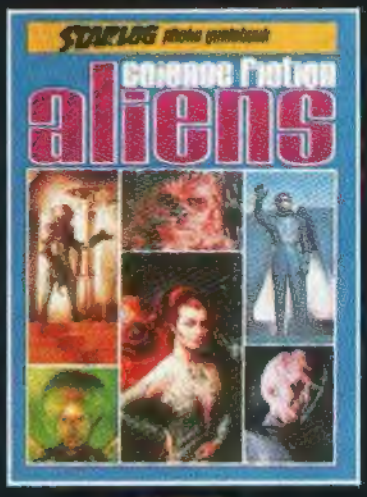

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